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Deconstructing Alternative Energy:

Discourse, Technology & Politics

by

William H. Mohns

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Arts

Department of Sociology

Edmonton, Alberta

Fall 2003

University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled ***Deconstructing Alternative Energy: Discourse, Technology & Politics*** submitted by **William Henry Mohns** in partial fulfillment of the requirements for the degree of **Master of Arts**.

To Tosha

Abstract

In this thesis I use discourse analysis to deconstruct the dominant narratives surrounding alternative energy development in Canada. I critically examine the advocacy, practice, and policies of green power in Canada, supported by comparison with green power experiences internationally. I focus upon wind energy as a key example of alternative energy, and on issues related to eco-labelling initiatives for electricity. Further, I attempt to make connections between contemporary and historical discourses of energy and environment.

Through this analysis I develop the concept of a dominant *green power narrative* whereby alternative energy technologies and resources are essentialized and naturalized in relation to potential environmental and social impacts. The result is an *alternative energy imperative* in which green power development becomes viewed as an end goal itself, rather than as one means to reducing undesirable environmental and social impacts of energy systems. Following from this analysis I call for broader, more creative and more radical plurally democratic approaches to the discourse and politics of energy and environment.

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CHAPTER I. INTRODUCTION

There are several stories I want to tell about wind power and alternative energy in this thesis: stories about how technologies come to be imbued with particular meanings, viewed as something more than material objects. This thesis is about how a set of energy technologies and resources—solar, small-scale hydro, geothermal, biomass and in particular, wind—have come to be known as clean, green, benign, alternative, renewable and environmentally-friendly. The notion that these technologies and resources—what I will call techno-sources—are environmentally-friendly is frequently taken for granted and treated as commonsense in contemporary energy and environment discourses. Such a conception forms the heart of the hegemonic stories of alternative energy, what I call *the green power narrative*. The purpose of this thesis is to deconstruct this narrative and to present alternative ways of looking at energy technologies and resources.

Methodology and Organization

Deconstruction is a descriptor of my project[1]; discourse analysis is my method. This discourse analysis is an engagement with text and context: an exploration in the sociology of knowledge and an exegesis of ideology and ideological history. Such an approach involves taking a lengthy and winding course through an expansive and complex terrain.

My analysis is focussed concomitantly on language and on historical and ideological context. In forming this approach I am guided by the words of Edward W. Said (1978):

> The things to look at are style, figures of speech, setting, narrative devices, historical and social circumstances, *not* the correctness of the representation nor its fidelity to some great original (p. 21).

In doing so, I take the understanding that green-ness—that quality that is presumed to bind alternative energy technologies—is *not* an inert fact of nature. It is rather, like Said's description of Orientalism, "an idea that has a history and a tradition of thought, imagery, and vocabulary that have given it reality and presence in and for the West" (p. 5). This understanding conditions the approach I take throughout this thesis.

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[1] My intention is not to do a Derridian deconstruction. Nevertheless, I am indebted to his work on the subject. In particular, see Derrida (1988; 1976).

As such, I present my project in this way: The end goal of the thesis is a deconstruction of the dominant social meanings in Canada (with substantial reference to the United States and Western Europe) of the particular set of energy techno-sources frequently called alternative or green[2], and my particular focus is on wind power. I work toward this goal through an analysis of key examples of contemporary green power discourse, with a particular focus on texts that advocate the rapid development of alternative energy techno-sources.

The body of this thesis is comprised of three parts:
Chapter II delineates some of the common narrative devices used in the social construction of the phenomena of green power. While the perceived material features that alternative energy techno-sources have in common are frequently discussed (e.g. low environmental impact), the features of the discourse that attempts to unify them are left entirely unaddressed. My goal here is to provide an initial outline of the key features of the hegemonic narrative of green power discourse.

Chapter III links alternative energy to historical experiences and ideologies of energy and environment, while also embedding alternative energy in the context of contemporary western discourse on the environment. I do this through a focus on three intertwined threads of energy-environment discourse: environmental crisis, development and colonization, and climate change.

Finally, Chapter IV of the thesis focuses on institutional policy and politics on green power through an examination of Canadian cases, informed by reviews of international experiences with green power practice and policy[3].

---

[2] As mentioned elsewhere in this thesis, above and below, there are numerous terms that could be used here, including the word renewable. In this thesis I will primarily use the terms green power and alternative energy to describe the set of techno-sources that includes wind, solar, biomass and geothermal power.

[3] In Chapter IV in particular, though elsewhere as well, I am deeply indebted to the work of Michel Foucault (1980) for my conceptions of power and the role of the expert.

This thesis is one path exploring and attempting to unite seemingly divergent and infrequently connected discursive locales: The narrative I hope to weave is one in which we consider the ideological and socio-material connections between the politics of colonialism, electrification[4] and environmentalism, and thus between historical and contemporary understandings of nature and energy. As such, I mean for this thesis to be path-breaking, rather than exhaustive, thorough or neat. While the end goal of this thesis is deconstruction of a social concept, my purpose also lies in tracing a particular path of interconnections. The measure of success lies in convincing the reader that the somewhat disparate ideological-discursive histories I trace here do indeed link up in ways that are important to our current understanding of energy and environment, particularly as these linkages relate to the eco-social issue at hand: wind power and the category of alternative energy.

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[4] In the context of energy, enlightenment thinking becomes manifest in a desire to bring ever more energy to a problem, situation or society and to extend the use of electricity to ever-greater spheres within Western society and throughout the world: this is the desire for electrification. The desire for electrification closely parallels the desire for enlightenment. The call to produce and apply ever-greater quantities of electricity for use in ever-greater spheres reflects the most despotic conceptions of enlightenment, where in darkness "there remains nothing for honest people to do but to sleep" and procreate, and "the most infallible means of making it become brighter is to increase the light, to remove as many dark bodies as possible that block its passage, and especially to illuminate painstakingly all the dark corners and caverns into which the light-shy person... drives himself" (emphasis added, Weiland, 1789/1996, p. 81). Increasing and extending the light to "all the dark corners" refers not only to the ideological light of the mind, but to the literal light that is brought by energy. In this thesis I am explicitly attempting to present an understanding of electrification as a socio-political project/process, in contrast to conventional electrification rhetoric that tends to convey an understanding of electrification as an inevitable (that is to say pre-political) technological process that affects—affects a people—rather than being affected by people.

CHAPTER II. THE GREEN POWER NARRATIVE

Semiotics of a Wind Turbine

In contemporary western discourse, the image of a wind turbine has taken on a multiplicity of meaning. Images of wind turbines are used in everything from science fiction video games and pop music videos to energy company annual reports and environmental text books. The wind turbine has come to represent an apex of environmental efficiency and high technology: it is the poster-child for ecological modernization, and it is urban eco-tourism. The image of a wind turbine in the mass media more often signifies ideas and ideologies rather than any material connection to wind energy: it is used to represent harmony with nature and a connection to the past, and it is a point where environmental responsibility and economic growth meet[5]. The image of the wind turbine has come to occupy a unique place alongside hydroelectric dams in representing that ubiquitous and invisible power—electricity. And like the almost mythological power of the sight of a hydroelectric dam (think of Hoover, Grande Coulee, La Grande, Aswan, Three Gorges, etc.), the wind turbine represents much more than simply a technology for converting energy into electricity.

This multiplicity of meaning forms an important part of an emerging narrative of renewable energy. In this hegemonic narrative, renewable energy technologies are both revolutionary and evolutionary. They are a "natural selection" among "evolving choices"[6]: a part of the revolutionary toolkit of environmental radicals and green politicians, and the next stage in the evolution of the transnational energy concern. In the green power narrative, renewable energy is evolutionary in that it is a technological accomplishment of rational science and its increasing use is the inevitable product of a

---

[5] An interesting question to ask after the myriad of wind turbine images circulating in the Canadian media is as to where they come from. Frequently, the connection appears to be more ideological than material. For example, the cover photo of the book *Sustainable Development and Canada: National and International Perspectives* (Dwivedi, Kyba, Stoett and Tiessen, 2001) features a row of wind turbines. However, the photo does not appear to be of any wind farm in Canada and there is no mention of wind energy in the book's reasonably extensive index. Thus I am left to assume that image is significant to the book as a representation of sustainable development, and of the meeting of cutting-edge technology, economic development and environmental responsibility.

[6] *Natural Selection: Evolving Choices for Renewable Energy Technology and Policy* (2000) is the startling title of a report by the United Nations Environment Programme's Division of Technology, Industry and Economics.

rational market and rational politics. Renewable energy is revolutionary—in the seemingly bloodless sense of enlightenment politics—in that social and environmental change is seen as inherent to its use.

In this section of the thesis I outline some of the primary features of the green power narrative through the analysis of two recent examples of mainstream green power discourse. First, I look at a recent article on wind energy that appeared nationally in the *Globe & Mail* newspaper entitled "Who has seen the wind power?: In the post-Kyoto age, the Canadian energy industry is gearing up to reap the benefits of airborne kilowatts", written by the *Globe & Mail*'s environmental reporter, Martin Mittelstaedt (2003). I have chosen this article because it is typical of contemporary green power discourse in Canada: typical of both green power discourse as it appears in mainstream media and of the rhetoric of green power advocates (industrialists and environmentalists). Second, I analyse a chapter in Gordon Laird's recent book on energy in Canada, *Power: Journeys Across an Energy Nation* (2002). Laird is a celebrated political author among the Canadian bourgeois left and the book and Laird's accompanying cross-Canada promotion tour received considerable mass media attention. Through looking at some of the ways in which wind energy is presented to the reader in these two texts, I am setting up the green power narrative that is to be deconstructed in this thesis.

Key Elements of the Narrative: Green Power as *Deus ex Machina*

At the heart of the green power narrative are the beliefs that alternative energy technologies are inherently environmentally-friendly, and that they represent a solution to a series of social and environmental problems, including global warming, air pollution (particularly smog and acid rain) and respiratory illness, natural resource depletion and limits to energy growth, fluctuating energy costs, social inequality and international conflict over energy resources.

In Mittelstaedt's "Who has seen the wind power?" (2003) these beliefs are most clearly displayed in the following two paragraphs:

> Proponents say wind power is the perfect medicine for what is ailing a sick planet: It doesn't release carbon dioxide or other greenhouse gases, reduces smog and acid-rain pollutants[7], and doesn't harm wildlife.
>
> The winds blow over every country in the world, and no wind cartel can try to drive up its price. The Canadian Wind Energy Association estimates global wind energy potential, even excluding environmentally sensitive areas from development, is about five times current global electricity use.

The green power narrative also represents alternative energy as cutting edge technology. Mittelstaedt conveys this notion by presenting wind power:

1) As big business, "TransAlta Corp., the big Alberta electrical utility, said recently it will invest up to $2-billion over the next decade on wind turbines", "Canada... has the potential to be the Saudi Arabia of wind energy";
2) As revolutionary and growing rapidly, "energy experts say they've never seen anything like [it]", "there's about to be a wind power gold rush", "wind energy is about to change the Canadian landscape"; and
3) By portraying the wind energy industrialist as a pioneer and "a modern-day prospector, looking for the gold of the future—clean, green energy" (2003).

Yet at the same time that alternative energy is represented as new and cutting-edge the green power narrative attempts to naturalize and normalize it. Alternative energy is presented as revolutionary but in a way similar to previous waves of rapid natural resource exploitation: it is "a gold rush" endorsed by "big utilities—even petroleum companies". While wind energy is presented as new, "a power source that 20 years ago basically didn't exist", it is also presented as old and pastoral, harkening back to the "Dutch-style windmills" of "medieval times". Similarly, wind turbines are rarely called

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[7] The claim that "wind power... reduces smog and acid-rain pollutants" is a seemingly inexplicable, yet common claim among wind energy advocates that relies on a series of tenuous assumptions that are rarely—if ever—acknowledged or expressed. The construction of a wind turbine, in and of itself, does not reduce smog or acid-rain. It is only if the construction of new electricity generating facilities is understood as necessary and inevitable, and if all other reasonable alternatives to the construction of a wind turbine lead to smog and acid rain, that such a claim becomes tenable. This notion will be explored in greater detail in Part III of the thesis: Green Power Policy and Politics.

power plants or power stations, but rather wind farms or wind parks[8] and when placed on agricultural land they are viewed as "a second cash crop" for farmers (Mittelstaedt, 2003). Allusions to windmills, parks, farms and to medieval Europe work to affect a naturalization and pastoralization of wind power, creating a sense of nostalgia and harmony around wind turbines in order to paint the wind turbine as part of a harmonious post-fossil fuel landscape.

Taken uncritically this green power narrative has important implications for how alternative energy development is understood in relation to plural democratic values and environmental regulation. As I will show through Gordon Laird's "The Windmill and the Reactor" (2002, p. 141-174) the conception of alternative energy as inherently benign and as *deus ex machina* for a series of environmental and social problems forecloses on open debate and a diversity of views on energy development.

"The Windmill and the Reactor"

In 1978 Langdon Winner was on a tour bus excursion to a nuclear power reactor under construction in Diablo Canyon in central California:

> The bus followed a windy road that surmounted several hills, and when the bus reached the top of the last hill, Winner caught his first sight of the gigantic power plant with its two gleaming white cooling towers. In the background lay the capricious coastline of the Pacific Ocean. Right at that moment a huge California gray whale surfaced in the distant waves, blew out a stream of water vapor from its blowhole, and then disappeared again beneath the waves. (Smits, 2001, p. 147)

---

[8] This is particularly true in English, German and Spanish languages. *Wind farm* is the primary term used in English to describe a collection of wind turbines, though it is also used in Spanish (*granja eólica*) and French (*ferme éolienne*). *Wind park* is the primary term used in Spanish (*parque eólico*) and German (*Windpark*), and receives frequent use in French (*parc éolien*) and English. Interestingly it is only in the French that we see a term such as power plant or power station receive substantial use (*centrale éolienne*). The website of the French wind energy consulting company EED (Espace Eolien Développement) laments the use of what it sees as the anglicized *ferme éolienne* and *parc éolien*, arguing that :

> L'emploi de "centrale éolienne" se justifie tout à fait par simple proximité avec "centrale hydraulique" ou "centrale solaire". Pouquoi aller chercher plus loin et rendre confus ce qui est clair? Par pur snobisme peut-être... [*sic*]
> [The use of "wind power plant" is justified by its' simple proximity to "hydro-electric plant" or "solar plant". Why look further and confuse what is clear? Pure snobbism perhaps...] (Espace Eolien Développement [EED], 1997-2002)

But in a phenomenological sense EED raises an important question which the suggestion of snobbism overlooks: that there are important ideological reasons for the use of *parc* and *ferme*, namely, the desire to portray wind energy as green, natural and pastoral.

Winner was overwhelmed by the juxtaposition of the whale and the reactor:

> Two tangible symbols of the power of nature and of human artifice: one an enormous creature swimming gracefully in a timeless ecosystem, the other a gigantic piece of apparatus linked by sheer determination to the complicated mechanisms of the technological society. The first offered an image of things as they had always been, the other an image of things as they were rapidly coming to be. (Winner, 1986, p. 168)

This event profoundly influenced Winner, leading to the famous essay "The Whale and the Reactor" (1980), perhaps the most well-known piece of Science & Technology Studies literature. The essay was later included in a collection of his essays by the same name: *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (1986).

In a recently published book, *Power: Journeys Across an Energy Nation,* Gordon Laird (2002) invokes Winner's powerful image of contrast by the chapter title, "The Windmill and the Reactor". In a discussion of the environmental and health problems related to Ontario's electricity generation facilities, the chapter juxtaposes the efforts of the Toronto Renewable Energy Co-operative (TREC) to build a wind turbine on the Toronto waterfront with Ontario's declining nuclear power facilities.

For both Winner and Laird the nuclear reactor represents the worst of high-technology and bureaucracy. Winner believes that the Diablo Canyon nuclear facility "is a prime example of an inherently political technology [requiring] authoritarian management and extremely tight security" (1986, p. 175). He argues that

> Diablo Canyon is simply a hideous mistake. It is out of place, out of proportion, out of reason. It stands as a permanent insult to its natural and cultural surroundings. (p. 175)

For Laird the contrast between Ontario's nuclear reactors and TREC's wind turbine is as striking as Winner's whale and reactor. Laird's wind turbine is natural, equivalent to both the windmill and the whale. Winner's whale is natural presumably because in its materiality it is not man-made; its ancestors may well have inhabited or traversed that area for millennia. By contrast, the windmill is a human artefact and its history,

particularly along the shores of Lake Ontario, is brief, while the history of the wind turbine in this location is non-existent. As Laird proudly notes, TREC is breaking new ground. It is "the first urban turbine ever proposed in North America" (2002, p. 143). This parallels Mittelstaedt's suggestion that the wind turbine is both new and old.

For Winner, the whale is natural and it belongs there, while the reactor does not. But why does the wind turbine belong? For Laird the wind turbine belongs because it is "environmentally friendly" (2002, p. 142), "an independent, non-polluting power source, owned collectively by citizens" (p. 143), "a proven, zero-emissions technology" (p. 143). He views TREC's work as "saving the planet" (p. 144).

Such an understanding of alternative energy has important consequences for plural democratic debate on alternative energy. Laird presents local concern about the construction of a wind turbine in a Toronto waterfront park as follows:

> "You're destroying our park!" someone shouts behind me. "You think you can put that thing up so it will tower over us? It'll be a scar on the land."
>
> "We don't like the idea of it being forced on us," says someone else. "It's public land and it's for us and our children."
>
> The topic at hand, surprisingly, is not a coal plant or a waste incinerator, but an environmentally friendly wind turbine. (2002, p. 142)

The notion that building the turbine on waterfront parkland will destroy the park surprises Laird and he finds "the thought of a wind turbine caught up in a federal environmental assessment... a little perverse" (p. 144). He implies that the citizens' concerns would be valid, or at least expected if the power plant were using different resources and different technology. However, since it is a wind turbine Laird judges the concerns to be ridiculous, and with his assertion that the wind turbine is "environmentally friendly", he interpellates his reader to judge these concerns to be ridiculous as well. "It's true" he tells us, "every summer, fossil-fuelled smog kills hundreds but some locals seem more passionate about keeping a funny-looking tower off their waterfront," thereby reducing criticism of the turbine to an eccentric aesthetic (p. 142). By dismissing the notion that a wind turbine should be subject to critical environmental impact assessment Laird is not

only arguing that a wind turbine is desirable, he is foreclosing on the possibility that it could be any other way. For Laird, there is something inherent in the turbine that makes it natural and unimpeachable, even if it is a 94 metre high, utility-scale energy generator located in an urban, waterfront park (see TREC, 2003). The result is an *alternative energy imperative* where the construction of wind energy facilities becomes an end in and of itself, and where the wind turbine is beyond reproach.

The sentiments expressed by Laird are emblematic of a common sentiment in green power discourse: namely, a belief that substituting alternative energy for fossil fuel energy will solve a wide-range of environmental and social problems without subjecting broader socio-political and material infrastructures to radical political critique. Laird implies that greater use of alternative energy is rational—that if one properly considers the issues, including human health and environmental concerns then the choice to further develop alternative energy resources and technologies is the logical decision, the correct decision, and the only rational decision.

In this way, the green power narrative remains deeply embedded within enlightenment discourses of modernization, and rationality, wherein technological and social progress are so deeply interrelated that the substitution of one technology or technological process for another becomes—not a political act—but a substitute for political engagement. In this rhetoric, a *technological fix*[9] becomes more than simply an incremental change in energy infrastructure and socio-environmental impact; rather, the techno-fix is seen as revolutionary. In negating political action, the techno-fix is represented as having wide-reaching social consequences that derive from qualities inherent in the technology, or technological process, rather than being a consequence of an exercise of hegemonic power. Such faith in the technological fix is indebted to the enlightenment belief that

[9] The term 'technological fix' was first introduced by former Manhattan Project physicist Alvin M Weinberg (1966) in his classic essay "Can Technology Replace Social Engineering?" Weinberg argues "that technology is capable of finding shortcuts (technological fixes) to the solution of social problems" (Teich, 1997, p. 30). For in-depth discussion and critique of technological fix ideology, see for example, Sclove (1995) and Teich (1997). The technological fix is the enlightenment equivalent of Greek drama's *deus ex machina* whereby in the final moment of the play (or at seven minutes to midnight, by the Doomsday Clock of the *Bulletin of the Atomic Scientists*), science (and the scientist) are able to rescue humanity and the planet through technological change.

scientific-technical progress will "gradually solve the problem of social inequality and transform the political power struggles among nations into a peaceful economic and cultural contest" (Vierhaus, 1996, p. 340).

Belief in the technological fix—typified here by Mittelstaedt's and Laird's perspectives on wind energy—represents one key way in which alternative energy discourse remains rooted in the discursive and political constructions of hegemonic energy politics. In the next section I continue to interrogate these dominant conceptions of alternative energy, by focussing further on the ways in which alternative energy is linked to and carries the traces of historical experiences and ideologies of energy and environment.

Chapter III. Environmental Discourse

In order to begin to deconstruct the concept of *alternative energy* we need to critically analyze the discursive context in which it has developed. Thus, if we wish to understand how certain energy techno-sources have come to be considered alternative, environmentally-friendly, benign or green we need to take a closer look at the broader context of environmental discourse that frames, contextualizes and affects such a discursive construction.

Environmental discourse is just one of many broader discourses that intersects with and informs the concept of alternative energy. It is, however, a very broad field and its intersections with, and influences upon alternative energy are far too numerous, multifaceted and complex to address adequately in this chapter[10]. So my intention here is to make some initial strokes in order to demonstrate the value and importance of examining broader discursive, socio-political contexts in order to gain insight into the construction of alternative energy.

In this chapter I focus on just two important aspects of contemporary environmental discourse: 1) the notion of an environmental crisis; and 2) representations of climate and nature in climate change discourse. In both cases, my aim is not to provide an exhaustive overview and analysis of the two aspects, but rather to highlight some of the key ways in which they contribute to current understandings of particular energy technologies.

[10] Such categorization of discourses is illusory: these categories are ill-defined, subjective, overlapping, interdependent and constantly changing. Nevertheless, popular western discourse on environment is a broad categorization that seems to have some coherence and broad acceptance, and so is a useful starting point from which to contextualize this notion of alternative energy.

PART I. ENVIRONMENTAL CRISIS AND DEMOCRATIC POLITICS

> The clock, we are warned, shows five minutes to twelve. Or even later. Be it Gaia, Worldwatch, or Brundtland, they set off the alarm and seek to alert us against the threat to the survival of the planet. (Sachs, 1999, p. 51)[11]

The notion that humanity faces a current or impending environmental crisis (or many such crises) pervades environmental discourse. In popular and in academic texts on environmental issues, such notions of crisis are frequently invoked to affect a sense of urgency and importance to the authors' arguments and contentions. For example, Anita Gordon and David Suzuki begin their 1990 text *It's a Matter of Survival* with the premise that

> More than any other time in history, the 1990s will be a turning point for human civilization. Not only are we facing ecological disasters that could affect our ability to survive, but the crisis is forcing us to reexamine the value system that has governed our lives for at least the past 2000 years. (p. 1)[12]

Such a reliance on crisis sets a particular tone and context for the arguments that follow. The crisis conveys a sense of desperation on the part of the author, with the goal of affecting a sense of desperation in the reader; it is a call for swift and desperate measures.

But what are the costs of such a rhetorical strategy? In this section I argue that the persistent invocation of an environmental crisis has profound consequences for the exercise of democratic politics. I argue that the use of crisis as a basis for environmental advocacy is silencing and anti-democratic. The environmental crisis imagines the current moment as an ecological state of emergency: an ecological eleventh hour when desperate measures are justified. As I will demonstrate in the following pages, the moment of the eleventh hour in contemporary western society is and historically has been a profoundly anti-democratic one, an effectively depoliticizing moment, and a moment of compromise where democracy and individual rights need no longer be maintained. The crisis is about a loss of control—social or ecological—and is embedded with ideologies of gaining

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[11] The clock approaching midnight also plays on the so-called Doomsday Clock of the *Bulletin of the Atomic Scientists*. According to *the Bulletin*, the clock, which debuted in 1947, "captured readers' imaginations, evoking both the imagery of apocalypse (midnight) and the contemporary idiom of military attack—the countdown to zero hour" (Educational Foundation for Nuclear Science, 2003).

[12] The text derives from a popular CBC radio series hosted by Gordon and Suzuki that ran in 1989.

control by any means necessary. The logic of the state of emergency eschews proposals for long-term change in favour of short-term action and compromise. Here, and throughout this thesis, I challenge such lines of thought as a basis from which to conceptualize and act upon energy issues.

Privileged Discourses and a Sense of Urgency

The invocation of the crisis frequently involves a call to power: an appeal to privileged power. The call to power occurs through an appeal to privileged discourses of science, national security (juris-political), or spirituality. The appeal to such privilege is seductive. In invoking a crisis backed by such privilege the author distances themselves from an explicit exercise of politics, while at the same time positioning themselves as expert, thereby solidifying their call to power in an attempt to privilege the arguments and calls for action that follow from their invocation of crisis.

An appeal to such privileged and exclusive discourses is one of two elements that are employed—through the use of a crisis—to affect a silencing of opposition. The second element is timing. The crisis is invoked along with the use of rhetorical devices aimed at creating a heightened sense of alarm and urgency. The first element (privilege) suggests that the crisis is an unassailable fact, determined by experts operating at a level of expertise unchallengeable by the reader; while the second element (timing) declares that there is no time for opposition, for second opinions, or for debate. It is this frequent pairing that makes the notion of an environmental crisis a particularly authoritarian politic. When environmental change is framed in frenetic and disastrous terms the effect (regardless of intentions) can be to pose an *end* against which virtually any *means* can be justified.

Gordon & Suzuki's *A Matter of Survival* (1990) epitomizes such a conception of crisis. In their introduction they tell us of the "virtual unanimity" among "scientists and experts around the world" that we and our environment are in peril (p. 2). Again on the very same page they state that "never before have so many scientists spoken with a single voice, warning, as Paul Ehrlich does, 'that something is seriously wrong... and if we wait

until the full-scale catastrophe, we may or may not survive it'" (p. 2). They say that the evidence is "hard" and we are in denial; "the simple truth is that we are the last generation on Earth that can save the planet" (p. 3).

To help create a heightened sense of urgency in the reader Gordon & Suzuki present a picture of what the world will look like in the year 2040 if we do not act immediately and decisively. The picture Gordon & Suzuki paint is one they call "Despair" and "Beyond Your Worst Nightmare". In their imagined world of 2040 seasons no longer exist, food is scarce, and things seem to get worse with each passing day. For them the world of 2040 is so gruesome that it would be an "apocalyptic vision of science fiction," were it not for the fact that this frightening world of 2040 is the result of "computer data used to formulate climate models" (1990, p. 7). They tell us that

> scientists are by nature cautious [yet] confronted with the catastrophic implications of their data some have broken this tacit vow of caution to take us on an unorthodox journey into the future, convinced that this is the nightmare world our children will inherit if we allow the greenhouse warming trend to continue. (pp. 8-9)

Gordon & Suzuki follow their projection with similar forecasts of 2040 by a NASA scientist and a researcher for the Worldwatch Institute (pp. 8-9). Such forecasts are a relatively common practice in environmental crisis rhetoric. An author will project forward some decades in order to demonstrate *a* consequence (though often it appears as *the* consequence) of current patterns of environmental degradation. For example, the introduction to Jeremy Rifkin's bestseller *Entropy: Into the Greenhouse World* (1989) begins in a similar fashion through descriptions of what the world will look like in 2035, should we continue to "[fail] to heed the entropic imperative" (p. xi). In Rifkin's "Greenhouse World" there is "a pandemic of cancer deaths... and exotic new diseases", "Bangladesh has ceased to exist" due to flooding, and downtown Phoenix has become so hot that it must be enclosed in giant air conditioned domes (p. 3). The goal of such a strategy is to shock the reader into taking urgent action. The apocalyptic narrative graphically tells us the high cost of not acting boldly and swiftly to resolve the crisis. Indeed, Rifkin warns us that "if we continue to ignore the truth" about what we are doing to the environment, "then we shall do so at the risk of our own extinction" (p. xi).

However, there is also a price to be paid in terms of the exercise of democratic politics for adopting such rhetorical strategies. In the following section I explore the cost of an environmental politics based on crisis rhetoric through a focus on one specific type of privileged discourse—national security—as a timely example of the connection between privilege and democratic politics.

National Security: Environmental Crisis as "Clear and Present Danger"

National security "is a consequence of the emergence of territorially defined and militarily capable sovereign state as a law unto its own" (Barnett, 2001, p. 26). It is the "product of particular, relatively recent historical circumstances; it is neither a timeless nor a universal truth" (pp. 25-26). National security is perhaps the most privileged of all discourses in western society. As Joni Seager (1993) writes "The 'national security' knot is the perfect defense" (p. 38). Those who are privileged to act in the name of national security are not bound by the normal responsibilities of disclosure: they do not need to justify their actions beyond claiming that they are taken in the name of national security, and that this very name (national security) prevents them from being able to fully disclose the reasons for and full extent of their actions. But it is the perfect knot because it is those who are able to claim the privilege of national security who are largely the people who get to define what constitutes national security: "'national security' is a vague and constantly shifting concept—it has no real or absolute meaning; it is whatever the military defines it to be" (p. 38). "Interpreting a challenge as a security problem raises its status: it is no longer merely a problem to be dealt with through mainstream institutions, but instead requires extraordinary measures" (Barnett, 2001, p. 25), so perhaps it is understandable that such power would be compelling to some environmentalists. Conceiving of an environmental crisis as a threat to national security demands attention to the causes advocated by environmentalists. As David Coon (1998) lamented about the struggle for environmentalists to get action on climate issues in Canada:

> The prospects of meaningful climate action remain bleak in the absence of public pressure. And public pressure requires a sense of clear and present danger. This places the onus on the environmental movement to play a far more prominent role in campaigning for climate action than it has to date.

Coon's use of the specific phrase "clear and present danger" is an important one. Through this phrase, he is arguing very specifically that the public needs to perceive environmental concerns over climate as a threat to national security so imminent as to be above normal exercise of democratic politics. It is a phrase that environmentalists resort to in order to emphasize even further how serious the crisis is, and it is frequently used in the context of describing the threat represented by climate change[13].

In the United States, the phrase "clear and present danger" carries with it very precise legal and political implications for the suspension of that which is normally considered to be the democratic rights of citizenship, particularly with regard to freedom of speech. Even outside of the United States it remains a phrase that carries considerable symbolic power.

Danger and the Nation

The "clear and present danger doctrine" originates with American Supreme Court Justice Oliver Wendell Holmes' 1919 decision on freedom of speech in Schenck v. United States. In this case Charles Schenck, the general secretary of the Socialist Party of America, was charged under the Espionage Act of 1917 for printing and circulating pamphlets opposing American involvement in World War I. The Espionage Act of 1917 was one of numerous laws passed during and following World War I by the United States Congress and by state legislatures to be used against "dissenters and nonconformists" (Kessler, 1993, p.573), and it is important to note that the clear and present danger doctrine was developed in the affirmation of such a law. In evaluating Schenck's exercise of speech, the court asks "whether the words used are used in such circumstances and are of such a nature as to create a clear and present danger that they will bring about the substantive evils that Congress has a right to prevent" (p. 576). The court determined this to be the test over whether the Constitutional right to the exercise of freedom of speech was outweighed by the necessity to preserve national security. An

[13] The list of groups who have referred to climate change as a "clear and present danger", is extensive and includes, for example, the Sierra Club of/du Canada (2002); Greenpeace (1997; Leggett, n.d.); as well as the Nader 2000 United States Presidential campaign (Nader, 2000). Publications in which this reference has appeared includes, for example, the *Globe & Mail*, (Torrie, 2000), *Discover* (D'Agnese, 2001) and *The Economist* ("Not sinking," 2000).

important clarification of this doctrine occurs in the 1927 judgement on Whitney v. California, where Justice Brandeis wrote that the right to freedom of speech may be suppressed only when "the incidence of the evil apprehended is so imminent that it may befall before there is an opportunity for full discussion'" (Brandeis as quoted in Kessler, p. 577)[14]. The implication of Brandeis' elaboration of the "clear and present danger" test is that any treasonous thought or expression must necessarily be irrational and that given sufficient opportunity, the rational citizen would come to realize the error of their ways, yet that at times such opportunity is not available and civil rights, such as freedom of expression must be suppressed.

In the environmental context, this means that to call something a clear and present danger is to suggest that opposition to the alleged danger is both treasonous and irrational. In order to fully appreciate the implications of such discourse we need to investigate the notions of nation and danger that such a concept relies upon. As Kessler notes:

> By defining the limits of protected speech in terms of the speaker's "dangerousness," the [United States' Supreme] Court permits groups, individuals, and categories of expression constructed as "dangerous" in other social, political, and scientific discourses to be considered in a similar manner with respect to speech. Consequently, the intertextual relations between distinctions in legal discourse and similar distinctions emanating from other discourses—discourses circulating simultaneously that sought to define the attributes of an "American"—are interpreted by the Court to construct political difference, constitute a spectrum of political speech, and reinforce intolerance. (1993, p. 563)

Such discourses of the time constructed "Americanism" in very narrow, xenophobic and nativist terms whereby political opposition became equated with inferiority and alienness. During this time

> Writers and orators continued to emphasize the moral and intellectual inferiority and inherent dangerousness of aliens, but added disloyalty to the list (Preston 1963; Murphy 1979; Higham 1963). In a series of speeches during the war, President Wilson branded all dissent as indicative of disloyalty, pointing an accusing finger at "hyphenated Americans," particularly those from Germany.

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[14] In this case, Charlotte Anita Whitney, a founding member of the Communist Labor party, was charged "under California's Criminal Syndicalism Act for membership in an organization advocating 'dangerous' ideas... [though] Whitney had not openly advocated violence and was associated with a faction that sought to channel the party's efforts and activities into established electoral arenas" (Kessler, 1993, p. 579). Justice Brandeis wrote the Supreme Court's decision upholding Whitney's conviction.

> Wilson attacked "citizens of the United States... born under other flags... who have poured the poison of disloyalty into the very arteries of our national life" (Rogin 1987: 238). Speechmakers and writers coined the expression "100 percent Americanism" to signify appropriate beliefs and actions of patriotic Americans. Higham (1963: 204-212) shows that this notion of patriotism demanded strict and universal conformity with national purposes and policies, a conformity that should be actively expressed with "evangelical fervor." (Kessler, 1993, p. 574)

Through this history we see how these prevailing attitudes among elites at the time constructed notions of Americanism and democratic rights that became entrenched in laws upheld through both the legal apparatus and popular discourses on dissent that not only persist today but have been particularly re-entrenched and even extended since the 2001 United States Presidential elections. Wilson's conceptions of Americanism parallel both Bourassa's Québec, and George W. Bush's "with us or against us" dichotomies of citizenship. As such, this analysis operates (in one way) as a caution toward the making of crisis and its long-term implications in the construction of identity and Otherness.

So by recourse to such discourse, the environmentalist too is implicating such conceptions of danger: explicitly, through the representation of opposing views, as well as nature or climate as dangerous; and implicitly, through a reliance on pre-existing conceptions of danger, of "Canadianism" or "Americanism" and of "foreign" or "alien" that circulate in public discourse (including historical conceptions of such terms).

What is National Security?

The concept of national security requires an imagining of an existing, common public culture as well as common public structures that both comprise, and are essential to the nation. Common public culture and structures must then be perceived as under threat and in need of protection. Such a conception of national security must therefore involve an essentialized and nostalgic notion of what that nation is—and therefore what that common public culture is—that is threatened.

The crisis sets up a perceived death or threat of death to this idea of nation. Through the notion of death, a reterritorialization of political space is enacted in which elites

(traditionally privileged groups) construct their interests in nationalized terms, creating a justification for assuming power over all citizens through recourse to their very privilege. Such a seizure of power occurs at the expense of historically marginalized peoples and of those with the least national resources and access to power. I argue here, that the environmental crisis is one example of what Berlant (1997) calls rhetoric of a "traumatized core national identity" (p. 2). Berlant explains that

> Today many formerly iconic citizens who used to feel undefensive and unfettered feel truly exposed and vulnerable. They feel anxious about their value to themselves, their families, their publics, and their nation. They sense that they now have identities, when it used to be just other people who had them. These new feelings provoke many reactions. One response is to desire that the nation recommit itself to the liberal promise of a conflict-free and integrated world. Another is to forge a scandal, a scandal of ex-privilege: this can include rage at the stereotyped peoples who have appeared to change the political rules of social membership, and, with it, a desperate desire to return to an order of things deemed normal, an order of what was felt to be a general everyday intimacy that was sometimes called 'the American way of life'. To effect either restoration of the imagined nation, the American ex-icon denigrates the political present tense and incites nostalgia for the national world of its iconicity, setting up that lost world as a utopian horizon of political aspiration. (p. 2)

That "lost world", is a world of power for the ex-icon: a world where their mastery over nature and humans goes virtually unchallenged, and where they felt safe in the notion that their privileged place was deserved. In this way the environmental crisis becomes that thing the ex-icon can rage against as the reason they lack the privilege they believe they deserve. In this way fighting the crisis gives the ex-icon a feeling of control over their new identity, whereby environmentalist, conservationist, deep ecologist, tree-hugger, activist, protester, and anarchist all come to represent marginalized identities (in the mind of the ex-icon): badges of their weekend warriorship. Such a marginalized identity demonstrates to the ex-icon that they are not the oppressors, but the oppressed—an identity that they believe confers privilege. Thus *solving* the crisis becomes their key to recovering "that lost world" of privilege. Any opposition to the idea of a crisis is therefore an opposition to their badge of marginalization, and to their attempt to regain their "utopian horizon of political aspiration". This sets up the central struggle of environmental politics as being amongst two privileged groups, diluting "the oppositional

discourses of the historically stereotyped citizens—people of color, women, gays, and lesbians" (p. 22), as well as those with physical and mental challenges.

The cost of crisis politics then—particularly when advanced through security discourse—is steep, yet rarely acknowledged[15]. And it is paid by those with the least access to political power. The crisis rhetoric tells us what the ecological consequences could be if we do not act, but the consequences of a hegemonic crisis politic are rarely, if ever explained.

In the section that follows I continue to build on Berlant's arguments about privilege and identity through an examination of contemporary climate change discourse and its connection to colonial ideologies of nature and energy.

[15] This price is perhaps most explicitly (but still not very explicitly) articulated by Rudolph Bahro "who is quoted as saying that the ecological crisis has reached such a level that there is no longer any place for democratic decision-making about humanity's relationship with nature" (see Thompson, 1997, p. 109, referring to *Der Spiegel* 26, 1992). While Thompson cautions us not to "extrapolate from one example [as] Bahro is a figure who has always sought to provoke," he also notes that Bahro "represents in extreme form a current of thought which is central to much green analysis (p. 110). Thompson calls this stream of thought "ecological authoritarianism" (p. 109) or "eco-dictatorial thinking" (p. 110). Thompson notes that even "some with apparently unimpeachable democratic credentials such as Jens Reich have argued in a similar vein. He quotes Reich as saying in a 1995 interview with *Der Spiegel* that "real change is not possible as long as constant elections are getting in the way" (as quoted in Thompson, p. 123). Reich, a former Member of the German Federal Parliament, was a vocal civil rights activist in the former-East Germany where he co-founded an influential social justice opposition party, *Neues Forum*. *Neues Forum* would later become part of the coalition that formed Germany's current Green Party, *Bündnis '90/Die Grünen*.

PART II. CLIMATE CHANGE DISCOURSE

In recent decades climate change has rapidly become the pre-eminent environmental issue in global politics, to the extent that it "can no longer be viewed as simply another in a laundry list of environmental issues; rather, it has become a key site in the global transformation of world order" (Miller and Edwards, 2001, p. 3). The intense focus of climate change discourse upon carbon dioxide emissions has been central to the increased attention focussed upon alternative energy, and as such climate change discourse is having very profound effects on the discursive and material development of alternative energy.

In this section I show how contemporary climate change discourse can be read as an extension of 20th century colonial discourses on climate and nature. I demonstrate that the desire to control climate and nature permeates contemporary discourses on climate and energy, just as it did through the 20th century.

Attempts to control climate represent a colonization of nature: an attempt to exert mastery over nature and a response to a fear of a nature beyond our control. The desire to control climate through both knowing and affecting climate is not new, but rather are extensions of a process and perspective that can be traced from European enlightenment and colonialism, through to dam building and water management schemes of the 20th century, and into present climate change discourse and politics. The purpose of this section is to begin to draw out these connections in order to contextualize the contemporary climate change discourse that plays such a large role in the current interest in alternative energy technologies. I show how colonial ideologies permeate energy development and climate discourse and I weave this thread from the early 20th century to the present through two brief case studies on climate and energy: the construction of the Aswan dam in the early 1900s, and the James Bay hydro-electric project of the 1970s and 80s.

From Horkheimer & Adorno (1947/1969) to Shiva (1989; 1997) there has been much said about the connection between colonization of people and nature. Colonization is

often propelled by a desire to control and exploit "resources". Colonized peoples have historically been viewed by colonialists as being closer to nature, and therefore as another resource to be controlled and exploited. This is still frequently the case today. When we consider the ways in which contemporary discourses on climate and energy are indebted to this colonizing history, this chapter should provide at least a cautionary tale for our understandings of the relationship between climate change and alternative energy.

Colonization and Nation-Building: People, Nature and Energy

British colonialism and the dam at Aswan

Large dam construction has frequently been a key instrument in the colonization of people and space. "British colonialists were the most ardent dam builders... in the late nineteenth and early twentieth centuries, leaving their mark most firmly on the basins of the Indus, Ganges and Nile" (McCully, 1996, p. 18) not to mention the indelible mark on the lives of the peoples of those regions. The British sought to convert land in these colonies from peasant farms into large, irrigated industrial farms backed by British capital to grow cotton, sugar cane and opium for export (McCully, 1996). The colonizers saw the Nile and its flow of water to the sea as a waste. Nature's only value was in terms of its direct utility to them, and the annual flood of the Nile was an affront to their perceived mastery.

In 1902 the British completed construction of the Low Aswan Dam "to regulate the Nile in order to irrigate cotton for the mills of Lancashire" (McCully, 1996). The Dam displaced thousands of Nubians living in the area of the Dam's reservoir and began to flood the antiquarian temples of Philae. The Dam was expanded in 1912 and again in 1933 to a final height of 118 feet (Hughes, 2000, p. 79), and with each expansion even more of the local peoples were displaced and more of the temples were flooded. However, for the British the project of colonization was paramount; in the view of then-military officer Winston Churchill, controlling the Nile was for "the welfare of the world" and the temples were a necessary sacrifice (see Hughes, 2000, p. 79; Addison, 1959, p. 43). In 1908, Churchill hoped that "one day, every last drop of water which drains into the whole valley of the Nile... shall be equally and amicably divided among

the river people, and the Nile itself... shall perish gloriously and never reach the sea" (as cited in McCully, 1996, p. 18), yet the Nubians whose homes and lands would be flooded received little consideration in the planning of the dam and gained little, if any benefits (Hughes, 2000, p. 79). Rather, it was the British who reaped symbolic and financial profit from the dam, at the expense of the people of the Nile.

Such situations and the attendant ideologies can be read throughout 19th and 20th century empires: British, French, Russian, American and Canadian. Canadians in particular have been some of the largest dam builders of the 20th century, domestically and internationally. The exploitation of "natural resources" is at the heart of Canadian mythology and nation-building. Canada's privileged seat at the global dinner table is not based on the size of its population, nor its military power, nor even its industrial productivity; rather, it is a complex result of its unique history of colonial nation-building and natural resource exploitation.

Canadian colonialism and the James Bay project

Perhaps Canada's greatest proponent of dam building was former Québec Premier Robert Bourassa who championed the rapid expansion of hydro-electric development in Québec. For Bourassa, like Churchill, the value of nature lay in its utility to the colonial Man, and the ability to control nature was not only glorious but also prudent. As Premier of Québec from 1970-1976, Bourassa championed the construction of the James Bay project (also known as *La Grande*), a complex of four dams on La Grande Rivière in Northern Québec that displaced 1900 Cree and Inuit peoples of Northern Québec and flooded more than 1.5 million hectares of land. For Bourassa such incredible alterations of landscape and forced relocations that are so characteristic of large dam building were of little concern. Rather, he believed hydro-electric power to be the "form of energy which has the fewest imperfections of all" (1985). In an attempt to regain the Premiership in the 1985 provincial elections, Bourassa presented the Québécois with *La Grande Balleine*: an even larger plan for the exploitation of people and ecology of Québec. Echoing Churchill, Bourassa declared Québec "a vast hydroelectric plant in-the-bud, [where] every day millions of potential kilowatt-hours flow downhill and out to sea. What a

waste!" (p. 4). In his pre-election book *Power from the North* (1985), Bourassa outlined his vision for the Cree lands of Northern Québec:

> As necessity dictates, North Americans will increasingly turn their attention toward the North and the promise which it holds. Hydroelectric potential is the lens through which our sights are being refocused. What once appeared to be a forbidding and barren land, only sparsely populated by the Inuit and the Cree, has become Québec's new frontier.... To more and more of Canada's citizens, LG2 [La Grande 2] and other similar projects are no longer only names in the newspapers, but places where they have lived, whose air they have breathed, and whose beauty and power they have personally experienced. Hydroelectric development has opened up a new region for many of us and has added a new ability to develop the great potential of our northern frontier." (p. 2)[16]

This reads very clearly as Bourassa's frontier colonialist manifesto, where the disembodied settlement of Northern Québec (and part of Labrador as well) by the *pur laine* Québécois (since Bourassa's words clearly Other the Inuit and Cree as marginal, non-Québécois) was Québec's manifest destiny. The resources are not only there for Bourassa's Québec to exploit, but they are obliged to not let them be wasted—a vision where processes which do not fall under human control and which are not directly manipulated and exploited by humans become waste. In Bourassa's vision of Québec, through their consumption of electricity, urban Québécois, Canadians and Americans consume and experience the lands of Northern Québec—a land which Bourassa both rhetorically and physically erases of its Cree and Inuit inhabitants[17].

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[16] Bourassa's representation of La Grande 2 as a place where Québecois have lived is a figurative one. As Desbiens (2001) notes:

> For the population of southern Québec, if James Bay was out of reach it was never out of view. Throughout the 1970s and early 80s, the La Grande complex was extensively mediatized through films, photographs, brochures and various informational documents circulated throughout the province. In addition, special radio and TV programming expanded the project's visibility: the inauguration of the LG-2 powerhouse was a major event in the province, broadcast live on television.

[17] As Desbiens (2000) writes, Bourassa "stayed firmly behind his 'project of the century'—as he commonly referred to it—despite the controversy concerning native land rights that surrounded it. Prior to announcing the regional development scheme, neither Bourassa nor any member of his government had consulted with the native communities inhabiting the territory" (p. 17). Borrowing again from Desbiens (2000), this notion of Northern Québec as pristine frontier territory rightfully belonging to the Québecois

> Is exemplified in the recent controversy over the *Jardin du bout du monde* (Garden at the end of the world). To commemorate the twentieth anniversary of the French Language Charter (also known as Bill 101), the Quebec Toponomy Commission wrote a 'geographical poem' by renaming 101 islands in the head reservoir of the La Grande complex using words taken from famous Québecois literary works. The project was received with outrage by the Crees who reminded the Commission that these 'islands' had been mountains and hills prior to their flooding

In Canadian nation-building mythology, as in other colonial empires, those who conquer nature are heroes, and those who oppose them are enemies. Though Bourassa's plan for *La Grande Balleine* was never fully realised, it won him re-election[18]. Meanwhile those who opposed him faced harsh consequences. Many Québec politicians, business leaders and citizens responded with outrage to the protests of the Cree, whose livelihood was threatened by the proposed mega-project. One journalist summed up this reaction—as well as the preeminent place Hydro-Québec occupies in the psyche of the Québécois—as follows:

> I think a lot of Quebecers would agree with the Cree that Hydro-Québec doesn't do everything right. But this isn't any old company, Hydro-Québec. This is, you know, the instrument of emancipation of, of 'La Belle Provence'. It is the way Québec went from an age of darkness to an age of light and you just don't beat up on, on a sacred cow, which Hydro-Québec is. (Pelletier, in Isacsson and Salzman, 1996).

Throughout Canada, to oppose the dominant discourses of natural resource "management" and "development" is akin to treason: anti-logging protesters are "enemies of B.C." (see for example Glen Clark as quoted in Hunter, 1997), and "eco-freaks with no professional credentials" who tell "fairy stories" (Schindler as quoted in Pratt & Urquhart, 1994, p. 197)[19]. Or worse, they are cast beyond the realm of internal

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> and that they already bore native names. A speaker for the commission stated that 'We were certain that the territory was anonymous, completely virgin, simply because it is not a site where the population is concentrated' (Le Devoir, 19 septembre 1997, A12, [Desbiens' translation]). (p. 20, footnote 29)

[18] It also immortalized him: after his death in 1996 LG2 was renamed in Bourassa's honour. The connection between power over nature and political power and prestige is an intimate one, of which Churchill and Bourassa are but two examples. Consider also the career of Canadian energy magnate Camille Dagenais: As CEO of the engineering firms SNC and SNC-Lavelin, Dagenais was another of Canada's greatest dam-builders and dam proponents. He moved on to lead the Canadian Nuclear Energy company CANATOM (a subsidiary of SNC-Lavelin, involved in nuclear power projects in at least 10 countries). Retired, he now holds the prestige appointment of Assistant Deputy Sergeant at Arms for the Canadian Federal Government and he was one of twelve Canadians immortalized in the project *Rare Spirits: A Personal Tribute to Vintage Elders*. Given his powerful position within an industry with such profound environmental impacts, how he views nature and ecology is thus of some importance. Dagenais is quoted as saying: "In my view, nature is awful and what we do is cure it" (as quoted in McCully, 1996).

[19] Ecologist David Schindler provides an interesting example here. He has been lauded for his work in the field of ecology and is frequently sought out by media and academics to speak as an expert on environmental issues. He tries to draw attention to the undesirable environmental impact of contemporary human societies. Yet Schindler is highly invested in discourses of environmental management and

threat; not only are they opponents, but they are not one of us, and furthermore, never were. Thus, to oppose hydro development in Québec is to "hold Quebecers hostage," to "discredit Quebecers" and to no longer be a Quebecer one's self (see Isacsson and Salzman, 1996).

By mapping this history of energy and colonization we start to see the ways in which control over nature is linked—through energy development—to the oppression of marginalized peoples.

What these two examples demonstrate then is the connection between the desire for control and energy developments as instruments used to affect that control. The purpose of this next section is to demonstrate the ways in which contemporary climate discourse continues to centre around control and to explore the potential for alternative energy development to be used to affect similar patterns of control and colonization.

Contemporary Climate Change Discourse

In many ways, this history of control and exploitation of nature and peoples serves as a crucial context for understanding contemporary climate discourses. This is a context, not only in the sense of a past that must be recalled and remembered, but a past and a present: a continuous thread that can be read through contemporary discourse on climate change.

Climate in the everyday: Desiring 'climate control'

Contemporary climate discourse is about a desire for control and a reaction/response to feeling like we don't have—or are losing—control. In quotidian western discourse, climate is constructed as knowable and predictable:

> Imaginary "norms" and "averages" are constantly invoked, while the weather is ceaselessly berated for its perversity, as in "We have had an unusually dry/wet season" or "The weather isn't like it used to be...." [Yet] the "average" is merely an abstraction. Indeed, nothing is less likely to occur than "average rainfall." At Los Angeles City Hall, [the average annual precipitation] has been hit only a few

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objective science, such that political action that does not subscribe to the tenets of these discourses is ridiculous.

> times in the 127-year history of measured rainfall. Indeed, only 17 percent of years approach within 25 percent of the historical average. (Davis, 1999, p. 16)[20,21].

Attempts to predict and know climate are elaborate and numerous. We create a multitude of statistical norms around constructs such as temperature and precipitation, we construct countless images to represent climate in relation to geopolitical boundaries, and elaborate computer models and simulations of imagined climates that we can control. In this way climate becomes unified, televisual, predictable and knowable, and we retain some semblance of power and control, as climate and nature become unified in the boundaries of our television screens:

> Natural conditions—day or night, heat or cold, windiness, cloudiness—are computer-processed into a composite image of brilliant colors that are gorgeous to behold and only arbitrarily related to earthly manifestations. Infrared satellite images... show us that white is cold, black is hot, the winds range from blue to yellow, and the oceans from red to purple, while the hole in the ozone is grey or violet. (Berland, 1996, p. 127)

Through this televisual construction of climate and weather Berland argues that "we are looking at a new type of landscape literacy, in which the 'modern' perspective of the human eye is rendered obsolete" (p. 127) and climate becomes an instrument of human control. In creating the televisual landscapes on which we see representations of weather patterns fast-forward, pause, rewind and loop, we are creating a proxy world where we can have the knowledge and control of weather that we desire but fail to achieve in the modern world.

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[20] While Davis is writing these quotes in the context of Southern California and "other Mediterranean and dryland environments" (1999, p. 16), I believe his arguments are similarly applicable to all western climates, even those that have been much more stable and predictable in recent history. Weather forecasting and quotidian public expectations of weather do not vary greatly across place and space in Canada and the United States, but rather are conditioned by deeply rooted conceptions of steady-state climate (what Davis and Stephen Jay Gould call uniformitarianism), as well as by the conventions of mass media weather reporting.

[21] Statistics joke on the use of averages:

> Three statisticians go hunting. When they see a rabbit, the first one shoots, missing it on the left. The second one shoots and misses it on the right. The third one shouts: "We hit it!" (Pacific Institute for the Mathematical Sciences, March 2003)

Playing out the desire to control through the creation of proxy worlds or models is at the forefront of contemporary climate science. As *Time* (Canadian Edition) tells us "Canada's most powerful supercomputer" belongs to the Canadian Meteorological Centre (CMC). While the supercomputer is used to predict weather "the CMC superprocessors are also working on a bigger problem: global climate change" (Turner, 2002).

The rhetorical location of climate as the site of the *problem* is both revealing of underlying conceptions of nature and has profound consequences for how the *problem* is conceived of and acted upon.

Climate stability

The desire to know involves a normalizing impulse. As the Davis quote demonstrates above, there is a strong desire, not just to find patterns, but to map them onto to the weather, and thus order and normalize weather and climate. To normalize is an effort to make predictable, stable and uniform. Indeed, the notion of climate as stable and uniform is deeply engrained in North American popular culture, perhaps nowhere more so than in climate change discourse. Climate change discourse sets up the notion of a stable climate as part of a nostalgic past to be regained. For example, *Canadian Solutions: Practical and Affordable Steps to Fight Climate Change*, a report published jointly by the David Suzuki Foundation and the Pembina Institute for Appropriate Development begins with the pronouncement that:

> The global climate is changing, regional weather is changing and the negative effects upon our environment and upon human activities, including our economy, are likely to grow in severity and scale. Now is the time to take affordable, practical and effective action to restore climate stability by using energy more efficiently and using cleaner energy. (Hornung, 1998a, inside cover)

Here the notion of a stable climate is set up as a fact of the past and as certain consequence of future action on energy issues. Such a notion is repeated throughout the report, urging Canada and Canadians "to play a positive role in restoring climate stability" (Hornung, 1998a, inside cover), to "build a solid foundation for Canada's contribution to global climate stability" (p. 83), and cautioning the reader that "any

efforts to restore climate stability are doomed to failure unless Canada joins with the rest of the world community and reduces greenhouse gas emissions, primarily through reduced consumption of fossil fuels" (p. 83). What is most significant here is the way in which climate is set up as the focus. Climate change is the *problem*, the primary thing to be fought, and a stable climate is the goal.

This focus on a changing climate reads like Berlant's "traumatized core national identity" (1997, p. 2), particularly when it is advanced through crisis arguments such as those discussed earlier in this section. The desire for a stable climate represents that "desperate desire to return to an order of things deemed normal" in which the ex-icon "denigrates the political present tense and incites nostalgia for the national world of its iconicity, setting up that lost world as a utopian horizon of political aspiration" (p. 2). In this way the idea of a stable climate comes to stand in for colonial power and privilege as *that lost utopia*. It becomes the ex-icon's emblem and cause, occupying their sense of entitlement to the nostalgic past of privilege where they had a sense of mastery over nature. In short it becomes their crisis!

Fight climate change!

In seeking *that lost utopia* the ex-icon resorts to what I call *fight climate change* discourse in which climate change, not greenhouse gas emissions, social inequality or environmental degradation becomes the enemy.

The phrase "fight climate change" has become a central mantra of popular environmental discourse over the past decade. "Fight climate change" and similar catch phrases, such as "combat", "fight" or "battle" global warming can be found in the publications of every major environmental organization in North America, of virtually every relevant governmental department and in the texts of a wide-variety of both alternative and mainstream media. Fight climate change has become a powerful touchstone for environmental concern at the turn of the 21st century.

The discursive and political implications of the phrase "fight climate change" are in many ways quite different from that of, for example, "fight greenhouse gas emissions", and the implications of both of these phrases differ from those of a call to "reduce greenhouse gas emissions," "reduce fossil fuel use," or "conserve energy". Phrases such as "fight climate change" or "restore climate stability" or even "protect climate" do not define, or even imply responsibility for environmental changes perceived as undesirable, nor do they provide direction for a response or solution to the perceived problem. "Fight climate change" does not, in and of itself, explicate or differentiate between the types of climate change that must be fought, the ways in which such a fight must take place, or who is responsible for carrying out such a fight. These factors make a focus on climate particularly malleable, and thus attractive to a wide-variety of interests: one can be in favour of fighting climate change without necessarily committing to any particular ideological, political or policy position. For example, a government commitment to "fighting climate change" does not explicitly target a given industry, or aspect of social, political or economic organization that must necessarily be affected by such a program.

While the need to reduce or "fight" emissions of carbon dioxide and other greenhouse gases is frequently read through the phrase "fight climate change" or explicitly targeted with texts that utilize this mantra, the use of "fight climate change" does not compel such a reading. The ways in which climate change can be combated are much more numerous, more open to interpretation than even the less common phrasing "prevent climate change". "Fight climate change" can mean—as in the case of the oft-cited example of Maldives—the construction of large dikes to hold back rising sea-waters, and other solutions (such as Rifkin's domes over Phoenix) which do not address responsibility or inequality. Further, programs to "fight climate change" or even "fight greenhouse gas emissions" could include revisiting proposals for large-scale hydro-electric or nuclear electricity generation programs, or seemingly far-fetched projects such as iron-fertilization of oceans to absorb large quantities of atmospheric carbon. What currently seems politically-untenable can, of course, change quite quickly, just as the apparent possibility of a revitalized North American nuclear energy industry seemed to change virtually overnight with the unveiling of United States' President George W. Bush's

national energy strategy on May 17, 2001. To many environmental activists and much of the public, large-scale nuclear development appeared defeated by the mid-1990s following from a string of public criticism over soaring maintenance costs, plant shutdowns, and nuclear accidents (particularly those in the Ukraine and Japan). But the current obsession with finding a technological fix to greenhouse gas emission concerns has resulted in, for example, a reinterpretation of nuclear energy, as I will discuss further in the next chapter.

So does alternative energy offer the potential to parallel 20th century dam building in its relationship to colonizing discourses? The answer, I argue, is that it could.

The hegemonic histories of energy in the 20th century are histories of energy imperatives: of grandiose, top-down programs where local communities had little power in making the decisions about energy projects that would affect them. In these histories people and environment are seen as resources to be exploited and forces to be dominated.

To the extent that the discourse and politics of alternative energy and climate follow these patterns, they will produce similar results. Yet while there are many reasons to think that the histories that follow will be different, there is also evidence to suggest they will be similar. Consider once again the quote that I began the climate change discourse section with on p. 22; that climate change

> can no longer be viewed as simply another in a laundry list of environmental issues; rather, it has become a key site in the global transformation of world order. (Miller and Edwards, 2001, p. 3)

Miller and Edwards argue further that

> In the three decades since the 1972 UN Conference on the Human Environment at Stockholm, states have constructed a suite of new international environmental regimes, with climate change taking center stage since the mid-1980s. (p. 3)

In this way global climate governance works to solidify a link between governance of humans and of environment, and raises important questions as to who has the privilege to legislate in this way, and who should bear the cost and responsibility for the decisions made. This also leads to questions of who has the privilege of deciding:

What is green? What is desirable from the standpoint of concern for environmental issues? And if alternative energy is part of the *solution* to the problem of climate change, who gets to decide how it is developed?

CHAPTER IV.

GREEN POWER POLICY AND POLITICS: CONSTRUCTING GREEN-NESS

The concept of green power, in the sense of low-impact energy, is a new and rapidly developing phenomenon. The term was rarely found in the lexicon of North American mass media before the mid-nineteen nineties, yet it has come an incredibly long way in the years since. Wind and solar power developments have skyrocketed over the past decade to become the fastest-growing segments of the energy industry. National certification for green power has been in place in Canada since 1997, and green power can currently be purchased from most major electrical utilities in Canada, including: Hydro-Quebec, Ontario Power Generation, SaskPower, BC Hydro, Toronto Hydro Energy Services, Edmonton's EPCOR, and Calgary's ENMAX (see for example, Pape-Salmon et al., Feb. 2003). Green power programs are also in place throughout the United States, Australia, New Zealand and the European Union. Moreover, legislation is in existence or rapidly being developed in each of these countries to encourage and in some cases to require new development of green power generation facilities.

Nevertheless, the concept and practice of green power is still in its infancy. How green power is defined; how and by whom these definitions are used; and the political and ecological implications of such a project are all actively being negotiated. As such, the outcome of current struggles to define and legislate green power will likely have a profound impact upon energy systems for years to come.

The following chapter weaves together an epistemological critique of the concept and practice of green power supported and informed by an analysis of national and international cases in the advocacy, regulation and development of green power policy and alternative energy generation. I examine the policy, politics and rhetoric of green power in order to question the political and ecological implications—current and future—of the project of green power. My analysis is organized around three basic questions: How is green power defined? Who gets to define it? How are the resulting definitions

used? And how does green power development fit into the larger (eco-social-material) context of Canadian and continental energy systems?

To address these questions I critically examine current regulation, legislation, marketing, and generation of green power facilities followed by a review of environmental certification programs as a context to the issues at stake in green power certification and labelling. I argue that while the concept of green power labelling does offer the potential to work towards environmental and social justice goals, in practice it frequently essentializes technologies in relation to their environmental impacts. The result is that consumer choice is affectively reduced and the meaning and practice of environmentalism becomes narrowed, institutionalized, legislated and co-opted. I will argue that green power represents a particularly salient example of the undesirable potential of eco-labelling initiatives.

Green Power Overview

Definitions of green power vary considerably. In the vernacular (including mass media usage) the terms green power and green energy are often used interchangeably with renewable, alternative and clean energy to refer to energy technologies and resources that are perceived as having desirable environmental performance. In such contexts green power almost always includes wind, solar, geothermal, biomass and small hydroelectric power, but occasionally these terms are applied to all hydropower as well as energy generated from natural gas and nuclear power plants[22]. Examples of more formal

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[22] Electricity generated from natural gas, nuclear and large hydro-electricity facilities is frequently referred to as clean energy in Canadian media coverage of debate and negotiations surrounding implementation of the Kyoto Protocol. For example, Kate Jaimet writes in *The Ottawa Citizen* that "with 95 per cent of its power produced by clean hydroelectricity—and the potential for more hydro projects in the north—Manitoba has long seen Kyoto as an opportunity to expand its production and export of clean electricity" (Dec. 24, 2002). Ontario Environment minister Chris Stockwell made the following assessments of nuclear power in a national interview on CTV's program "Question Period":

> Nuclear power is cleaner than coal-fired power. I think everyone would agree with [that]. I think it's also sustainable in more ways than gas... and it's classified as clean power by a lot of people today" (*Question period*, 2002).

In another example, one of the key recommendations of the Pembina Institute and David Suzuki Foundation's co-publication *Canadian Solutions: Practical and Affordable Steps to Fight Climate Change* (Executive Summary) is a "switch from coal to natural gas and other renewable sources of energy to generate electricity" thereby implying that natural gas is renewable (Hornung, 1998b, p. 1). The Pembina Institute also contends that the Canadian Electricity Association is in the process of developing its own

definitions of green power are: "electricity that is generated from resources such as solar, wind, geothermal, biomass, and low-impact hydro facilities" (U.S. Environmental Protection Agency), and "electricity, generated from renewable resources, that mitigates climate change by producing few or no greenhouse gas emissions" (Raynolds and Pape, 2000, p. 4). Most expanded definitions of green power focus primarily on the resources and technologies used in the generation of electricity, often ahead of specifying performance criteria, or goals to be achieved in the generation of green power. While most definitions do not make specific reference to climate change, a focus on climate change, and carbon dioxide emissions in particular, often underlies the definitions. Air quality, and concern over the depletion of non-renewable resources are also concerns frequently expressed in definitions of green power.

Figure 3.1: EcoLogo

Definitions of green power are often developed in order to certify power products. In this way, green power, or green power labelling works as a type of eco-labelling, in the same way that paper products, food, clothing and textiles are often certified with an eco-label as being environmentally-friendly. In Canada, the Environmental Choice Program (ECP), operated on behalf of the federal government, is the dominant eco-labelling standard. ECP certification is represented by the EcoLogo symbol (Fig 3.1). The ECP's green power program is designed to certify and "to promote electrical energy sources that have greatly reduced environmental impacts" (Environmental Choice website, accessed Sept. 15, 2002). The leading American green power labelling initiative—The Green-e Renewable Electricity Certification Program—is administered by the California-based Center for Resource Solutions. "The Green-e Program calls a power product 'green' if it contains at least 50% renewable power, it has lower air emissions than traditional power, and it contains no direct purchases of nuclear power" (Green-E, March 22, 2001).

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green power criteria that "could include fossil fuel and large storage-reservoir hydroelectric projects with significant historical environmental impacts" (Dogterom, McCulloch and Pape-Salmon, Dec. 2002, p. 7).

There are two primary applications of green power certification. The first is in retail competition, where marketers offer power that is certified as green as an alternative to the standard power supply at a more expensive price (typically only a certain percentage of a consumers' power will be from green sources). The second scenario involves federal or provincial/state governments setting a "renewable portfolio standard", or RPS in which all power suppliers must include a given percentage of their power as green. In retail competition, green power certification is based on the notion of simplifying environmental choices for consumers, while providing a system of legitimation and regulation over the claims that power retailers make about their products in relation to ecology. When green power is a portfolio standard, the function of certification is to establish the criteria by which suppliers can meet the standard. In both cases the green power approach is based on the assumption that a single set of criteria based in science can be developed and agreed upon that will result in the ability to define some power as green and others, by implication as not green, or less green.

Currently there are RPS regulations approved in ten U.S. states, with legislation currently before the U.S. Congress to require utilities to include 10% of their electricity portfolio from renewable energy sources, achieved either through direct generation or a tradable renewable energy credits system. The legislation was passed by the U.S. Senate in April of 2002 and is currently "pending further action in conference committee" (AWEA, August, 2002). No such legislation has yet been introduced in Canada, though as I will discuss below, several groups are currently lobbying for such legislation.

Both retail market and portfolio standard programs act to affect increased demand and incentive for the production of green power. In either case, the resultant premium placed on green power is a crucial factor in much of the current and proposed development of renewable energy in Canada. For groups such as the Toronto Renewable Energy Cooperative and for many of the wind power projects found in the Pincher Creek, Alberta area the ability to command a premium price for their electricity is considered essential to the economic viability of their projects. The proposed RPS legislation in the United

States was a crucial factor in the construction of Canada's largest wind farm, Le Nordais. Hydro-Québec, who commissioned the project is one of North America's largest energy companies (the third largest electrical utility) and is highly-dependent upon sales of electricity to the United States.

The benefits of green power labelling and certification programs are that they offer consumers, power producers and retailers some assurance as to the ecological claims of power producers and retailers (thus legitimating the claims of certified producers and retailers). Green power certification also carries with it symbolic currency for consumers as a mark of their environmental commitment. For example, subscribers to Epcor's green power program received "I [Love] Green Power" signs for their lawn. Similarly, a subscription to green power is frequently used by businesses to symbolize a commitment to the environment, as evidenced by recent press releases issued by corporations and governments to announce their subscription to green power.

Eco-labelling and Impact Assessment

Eco-labelling

"Ecolabels are used on products and packaging to provide consumers with information about a product's environmental performance... [they] are primarily a method to provide information to the consumer of the environmental characteristics of the product" (Hes, 2000, p. 1). Since their appearance in the late 1970s ecolabels have very gradually but continually increased in ubiquity and profile. In 1977, Germany's Blaue Engel (Blue Angel) program was the first national eco-labelling program, followed by national certification programs in most western countries in the late 80's and early 90's including Environmental Choice in Canada beginning in 1988 and the Green Seal program in the United States in 1989. Eco-labelling is most prominent in products of the food, pulp and paper, and clothing and textile industries.

The International Standards Organisation (ISO) developed a set of standards on eco-labelling beginning in the mid-nineties that set out three categories of certifiable labels: Type I—Stamp of approval label; Type II—Self declaration label; and Type III—Report

Figure 3.2: Möbius Loop

card label. Type I labels are the most commonly used, both in green power labelling and in eco-labelling more generally. If a product or service meets a specific set of criteria, they can be certified to use the label. Type II labels involve a self-declaration by an organization as to a particular quality of its product or service, such as a label indicating the percentage of recycled content of product, or the Möbius Loop recycling symbol (Fig 3.2). Type III labels are the least frequently seen and are report cards or scorecards that indicates the performance of a product or process on several categories, similar to food labels indicating protein, fat, carbohydrates, sodium, etcetera.

Type I labels are the primary focus of this essay as these are the dominant type used in green power certification and labelling initiatives throughout the world but particularly in Canada and the United States.

Green power labelling issues are a particularly important topic in eco-labelling as legislation is being introduced and implemented in the United States and Western Europe to require green power production. To the extent that such legislation relies on green power certification to determine what power sources qualify under Renewable Portfolio Standard, or Renewable Obligation legislation, green power certification processes, criteria and judgements become further legitimized and entrenched as the defining determination of that which is green, environmentally-friendly or desirable and that which is not. The goals of both green power labelling initiatives and portfolio standard legislation are to stimulate rapid development of alternative power production facilities and markets for the products of such facilities. As I will discuss later, many green power programs demand that all or a certain percentage of the certified power is generated from new facilities. Due to the large capital and infrastructure investment required for any substantial energy development, and due to the lifespan of power plants (e.g. 20-30 years in the case of wind turbines) the standards set today and in the near future will have a substantial and long-lasting impact on energy systems. For these same reasons, there is

pressure upon legislators and certifiers to develop durable criteria, in part to provide a predictable and stable market for investment in alternative energy. Therefore the judgements and impact assessments made by those involved in the green power certification process, and the standards and processes that these programs subject energy developments to, will have a profound and long-lasting impact upon energy development and environmental discourse in Canada. As such, impact assessments and the resulting standards and mechanisms for evaluation are critical objects of study.

Which impacts count?

The evaluation of environmental and social desirability, or of the impact of a given process (product, service, or event) is a complex, contingent and subjective process. The impacts and effects of a process are numerous, varied and interdependent.

Consider for example, the evaluation of 'green' paper. Luukkanen (2002), in his examination of environmental pressures on the Finnish pulp and paper industry, asks why wood is the only production factor considered in environmental labelling of paper products in Finland and elsewhere in Europe. He argues that it would seem "quite logical to widen the scope of the criteria [to include] other factors of production." Since the pulp and paper industry in Finland accounts for roughly one third of the total electricity consumption, Luukkanen suggests that consumers should also be concerned about sustainability in energy production when they are buying green paper products. The choice of which factors are most important is a subjective one, and the choice of how many factors to include is somewhat arbitrary.

Comparing impacts

Similarly, consider the task of comparing two coal-fired power plants. Comparing CO_2 emissions from the plants might seem easy enough, but which CO_2 emissions will be included in the calculation? There are CO_2 emissions from the smoke stacks of the plants, but what other sources of CO_2 emissions should be considered? Depending on what type of coal is used and where it comes from, there could be different emissions resulting from the mining and processing of the coal. There are also CO_2 emissions associated with the

construction and maintenance of the plant (heating, cooling and other plant operations); the manufacture of specific technologies used in the plant, and the transportation of workers to and from the plant. If we decide to consider the transportation of workers, do we just consider those emissions associated with the fuel burned in transit? Or do we consider emissions resulting from road construction and vehicle construction and maintenance, all of which the workers and the plant depend upon?

We might decide that some of these associated CO_2 emissions are not necessary to the comparison, but such decisions would involve choices that not everyone would agree upon. Regardless, what is important to consider here is that CO_2 emissions are just one type of emission, and emissions are just one aspect of environmental and social impact. The problem of assessment and comparison becomes much more complex and subjective if we attempt to weigh different types of impacts. If for example, we want to compare the impacts of a coal plant, a large hydroelectric plant and a nuclear reactor, how do we view the different types of impact in relation to each other? How do we compare the eviction or relocation of citizens resulting from a large dam reservoir, with health impacts from coal emissions of volatile organic compounds (VOCs)? How do we compare uncertain future impacts of climate change with the similarly uncertain impacts of radioactive waste disposal? And how do we weigh in the potential risk of a nuclear accident that may never happen; or the daily psychological impacts on any nearby residents who live in fear of such an accident?

No energy generation facility will have zero environmental impact, and each facility will have different types of impacts. Impact on local wildlife, air quality, land use, water pollution, release of hazardous chemicals, and consumption of non-renewable resources are all factors that need to be considered. And any such consideration will necessarily involve choices that contain subjective valuations and understandings. This is the challenge of social and environmental impact assessments: to enumerate and relate such impacts.

If we accept that "impact assessments are not definitive texts which present the truth about a projects and its impacts," but rather "[stories] to be written by those performing the assessment" (Phillips and Edwards, 2000, p. 1; p. 64), then what is crucial is how we interpret and act on them. In the example of green power, the complexity, contingency, and subjectivity of these evaluations is, undermined if the purpose of an assessment is to reduce the conclusions to a Manichean binary of green/not-green, or to place power plants on any kind of linear continuum of green-ness. Such reductionist strategies fail to acknowledge the subjectivity of the valuation, and as such, tell us more about power and authority then they do about the relationships between energy, society and environment.

A case study in green power advocacy and assessment

From here, I want to elaborate these arguments through an analysis of key texts in the advocacy and certification of green power in Canada and the United States. The purpose of analyzing these documents is to understand how an affective objectivity is created out of these subjective valuations and to understand the expertocratic and anti-democratic consequences that result.

In particular I focus on two reports by The Pembina Institute for Appropriate Development (referred to hereafter as Pembina, or The Institute): *The Pembina Institute Green Power Guidelines for Canada*, or *Green Power Guidelines* (Raynolds and Pape, July 2000); *Life-Cycle Value Assessment of a Wind Turbine: Alberta, Canada*, or *LCVA: Wind* (McCulloch, Raynolds and Laurie, February 2000).

The Pembina Institute is a leading Canadian organization in advocacy and research on issues concerned with environment and energy. The Institute's slogan is "holistic and practical solutions for a sustainable world" and The Institute describes itself as "an independent, not-for-profit environmental policy research and education organization" (Pembina Institute for Appropriate Development [PIAD], 2002). Founded in Drayton Valley, Alberta, the Pembina Institute has offices in Vancouver, Drayton Valley, Calgary, Toronto and Ottawa. Pembina is a founding member of the Clean Air Renewable Energy Coalition (CARE) and produces the following websites on environment and energy:

climatechangesolutions.com, re-energy.ca, Ride the Wind, EcoAction.ca, MyKyoto.ca and LCVA.ca, in addition to the organization's main site (www.pembina.org). LCVA.ca "is a subscription-based website used as a reference library and analytical tool to aid in the completion of LCVA's" (PIAD, 1998-2002). The site acts as a clearinghouse and advertisement for the Pembina Institute's LCVA methodology that it describes as "a unique and effective methodology to ensure that the major environmental, economic, and social impacts of a project, purchasing decision, design option, or a process technology selection are fully considered across the entire life-cycle of a product or production system" (PIAD, 1998-2002).

The term life-cycle assessment (LCA) is not new, nor unique to The Pembina Institute. It broadly describes approaches or methodologies interested in the social and/or environmental impacts of a particular product or process over its life-cycle, often referred to as a cradle-to-grave approach (see for example, Hes, 2000; Hyvärinen, 1999). What constitutes a products life-cycle and what associated impacts are included can vary greatly depending on how and by whom such an approach is applied. Unfortunately, The Pembina Institute does not acknowledge other such approaches or provide insight into what distinguishes its Life-Cycle *Value* Assessment from a Life-Cycle Assessment. In any case, LCVA is an important part of the Institute's current work and *LCVA: Wind* is a foundational text in this respect. To its credit, *LCVA: Wind* may well be the only such publicly available assessment of a 'new' renewable technology in Canada.

In *Green Power Guidelines*, report authors Marlo Raynolds and Andrew Pape review existing definitions for green power, outline the major ecological impacts of a number of energy resources and technologies involved in green power discussions and make recommendations for the adoption of a system of green power labelling. The report begins with the understanding that "public interest in the environmental impacts of consumer products and services has grown steadily in Canada over the last decade" and that "many electricity consumers have indicated their willingness to purchase power from a more environmentally sustainable source, even at a premium price" (p. 1). Based on these assumptions, the authors of the report make the claim that justifies the existence of

their work: that it is therefore, "more important than ever to have a clear understanding of what is meant be an 'environmentally sound source of electricity'--commonly called 'Green Power'" (p.1). *LCVA: Wind* serves as both a basis for *Green Power Guidelines*, and an example of the type of assessment recommended by it. Life-Cycle Value Assessment methodology has become a key function of the Pembina Institute's work, and *LCVA: Wind* is used by Pembina as a key example of this work. Given The Pembina Institute's focus at the intersection of environment and energy issues, and its promotion of the LCVA as its own analysis tool, these two reports provide an excellent organizing tool for this analysis.

The LCVA

As discussed above, evaluating the ecological impacts of energy developments is a dynamic, complex and subjective process. All energy developments will have ecological consequences, yet the specific quantity and type of consequences varies depending on the technology and resources involved, and will vary from project to project, depending on factors including, but not limited to: geography, project purpose, scale, who the end consumers are and where they are located relative to the project. As such, comparing the impacts of different types of energy projects, and reducing such comparisons to a dichotomy of green and, by default, not green (or placing energy sources along a continuum of "green-ness" to use an analogy of Raynolds and Pape) involves a process of valuing certain types of impacts in relation to others. This is a practice that necessarily involves subjectivity, reductionism and generalization. To what extent this is consistent with critical social movements and a democratizing political ecology is one of the questions directing this analysis.

In order to make such evaluations and comparisons, the Pembina Institute primarily relies upon and advocates the use of the process they call Life-Cycle Value Assessment which they define as

> a systematic methodology to identify, quantify and analyze the environmental, financial (and if desired, social) implications of each of the activities involved in producing and consuming a product or service. This process can unearth opportunities to improve the technical design, upgrade operating procedures, or

> substitute processes and materials in order to reduce costs and reduce environmental pollutants and other impacts. (Raynolds and Pape, p. 24)

In apparent contrast to the above quotes focus on quantification of impacts, Raynolds and Pape claim to consider the following quantitative and qualitative measurements through the application of LCVA methodology:

Quantitative factors:

Greenhouse Gas Emissions
Acid Deposition Precursors (sulphur dioxide and nitrous oxide)
Hazardous Air Pollutants (hydrocarbons, carbon oxide, nitrous oxides)
Particulate Matter
Ground Level Ozone Precursors

Qualitative factors:

Potential Impacts on Water Quality
Direct Impacts on Watersheds
Direct Impacts on Landscape
Potential Impact on Flora and Fauna
Noise and Visual Impacts
Hazardous and other Solid Waste
Sustainability of Feedstock

From the above assessments *Green Power Guidelines* concludes that wind power, solar power and run-of-the-river hydro facilities "have minimal environmental impact compared with the operation of conventional power generation technologies that are fuelled by coal or natural gas" (p. 7). In the case of wind energy the measurements and assessments are based on an LCVA of a single wind turbine in southern Alberta, published as *LCVA: Wind*.

The report recommends in its conclusions that the LCVA "or similar process [be used] to assess the conformity of the renewable energy technology or resources against... Green Power criteria", though for "smaller-scale technology" the report recommends that an LCVA of every facility is unnecessary (p. 20). But a reliance on LCVA methodology, as represented by the Pembina Institute's own work, is particularly incongruous with the

approach I take in thesis.

To begin with, the LCVA from which the data on wind energy is drawn—the only example of an LCVA directly cited in *Green Power Guidelines*—does not include in its analysis a number factors deemed to be too minor, or too highly variable. These include impacts involved with the manufacture of the wind turbine and tower, as well as those associated with the selection, exploration, acquisition and preparation of land for a wind energy development.

To quote the LCVA report, *LCVA: Wind*

> compares the life-cycle emissions produced by generating electricity from wind power with emissions produced from the use of coal (Alberta Inter-connected System) and natural gas in Alberta. The life-cycle analysis quantifies the potential amount of greenhouse gas emissions that could be offset by using wind power rather than coal or gas to generate electricity, and it assesses the potential environmental benefits from reducing emissions of acid rain precursors and ground level ozone precursors. (McCulloch, Raynolds and Laurie, February 2000, p. 1).

As indicated by the above quote, the report also excludes assessment of any of the qualitative measurements outlined above. In doing so, the LCVA appears to prioritize quantifiably measurable factors, over qualitatively measured factors and over indirect environmental effects. As such, where *Green Power Guidelines* obtains information as to most of these qualitative effects is left unexplained. The format of the report implies that the assessment of these impacts is taken from the aforementioned LCVA, which appears unfounded.

Methodological concerns: Standards of accountability and European experiences

One place where another source is referred to for qualitative assessment of wind turbines is in the category "Noise and Visual Impacts". The report acknowledges that there are "potential visual and noise impacts, particularly if [turbines are] located in urban areas," yet notes that "several have been successfully established in urban areas" citing the examples of "the European cities of Hamburg and Bremen, Germany and Copenhagen, Denmark". The reference to European examples here is an important one. Wind turbines

(as well as solar photovoltaic cells) are much more common in parts of Northern and Western Europe and have been in place for a longer period of time. As such, a sophisticated understanding of wind energy experiences in Europe—including infrastructure, policy, and politics—is an invaluable resource in developing wind energy policy and practice in Canada.

However, the passing reference to wind turbines "successfully established in urban areas" in Germany and Denmark exposes the very limited understanding of wind energy developments in Europe reflected in *Green Power Guidelines*. These developments have generated substantial opposition and controversy, particularly from the urban neighbours of the wind turbines. The only evidence Raynolds and Pape provide for the claim to success is ambiguous and woefully inadequate citation: "American Wind Energy Association email list discussion" (p. 8). Without even the mention of a particular source or thread on the email list the citation is unverifiable, and the grounds by which these urban wind energy projects are judged successful is unclear. The uncritical and suspect appeal to the authority of European examples raises further questions as to how the Pembina authors define success, as well as to the rigor of their analysis.

A further inconsistency between *Green Power Guidelines* and the analysis found in *LCVA: Wind* is in the standards to which each study holds alternative energy technologies. *Green Power Guidelines* contends that there is a continuum of environmental performance among energy technologies. While this reflects a more complex understanding of the differences between energy sources, it does not acknowledge that comparing the impacts of energy technologies involves subjective valuation, in which, for example, power sources could be placed differently on a continuum depending upon what criteria are used and judgements are made. More important to my present argument, the report places the most environmentally destructive energy sources on one end, "brown", of what they call a "continuum of 'greenness'", and suggests that there are "'olive' power technologies" somewhere in the middle of the scale which "can make a significant contribution to meeting our electricity needs with less

impact on the environment than 'brown' technologies"[23]. Yet the purpose of *Green Power Guidelines* is "to clearly define the characteristics of 'gold' technologies and management so as to differentiate them from other power sources" (p. 6). In other words, the authors contend that they are interested in only those technologies that have superior environmental performance. However, in the LCVA for the wind turbine, rather than comparing the impacts of the wind turbine to a given set of "gold standard" criteria, the facility is compared to "brown" and "olive" energy sources. Therefore, the rhetorical attention paid in the *Green Power Guidelines* report, if it is to rely on such life-cycle value assessments as those practiced by the Institute itself, would fail to result in any attention paid to these crucial issues. A failure which—as I will show later in the chapter through the use of international examples—can lead to wind energy projects which are opposed by communities in similar ways to that which oil, coal and forestry projects are often opposed by Canadians.

LCVA methodology, as represented here, is not conducive to affecting or informing democratic action by involved communities as it is shrouded in the exclusivity that is scientific analysis, and as mentioned, virtually ignores direct interactions between the wind facility and humans, flora and fauna. As a consequence, the report seems virtually irrelevant to the relationship between the immediate social and ecological systems in which a wind project is to be embedded, as it seems neither to consider such communities, nor be widely-accessible by them.

Green Power Policy: Legislating Green Power

There are a number of different ways in which green power definitions and certifications are applied, and a wide-variety of policy instruments and private initiatives through which green power technologies and resources can be encouraged. Very generally, these include: portfolio standards (a.k.a. renewable obligations), emissions trading or carbon

[23] The logic of colour theory seems to be lost on the report authors here. How a scale with brown on one end, and gold on the other would have olive in the middle—and why it would be called a "continuum of 'greenness'" seems inexplicable. However, the reference to a gold standard (and hence capital) as cleanliness and purity and as polar opposite to brown exudes an all-too-familiar logic and lineage of enlightenment and colonial ideologies.

credit instruments, tax incentives and exemptions (including increased depreciation allotments and investment tax credits), guaranteed price floors for green energy, and retail marketing programs.

Portfolio standards

In this section I focus on portfolio standards as a case study of green power policy. Portfolio standard legislation is currently being considered in the United States, referred to as the Renewable Portfolio Standard, or RPS (discussed above), and for the European Union as a whole and independently in some European countries, commonly referred to as a renewable obligation. A portfolio standards approach is strongly advocated for by dominant environmental and alternative energy organizations in Canada and the United States, including the Pembina Institute, Suzuki Foundation, the Sierra Club in both the United States and Canada, and the American Wind Energy Association. Renewable Portfolio Standards legislation is expected to eventually pass in the United States and as such has already begun to have a tremendous effect on North American electricity systems. Many of the largest Canadian electrical utilities are highly involved in and dependent upon electricity trade with the United States and as such will be affected by an RPS. Indeed, as mentioned earlier, the expectation of such legislation was a driving force behind the commissioning of Canada's largest wind farm on the Gaspé Peninsula of Québec (completed in 1999; see for example, Swift, 1998; Lundy, 1998).

Portfolio standards are based on an understanding of environment and energy such as that espoused by the Type I system of labelling, whereby a power source either qualifies as renewable, or green, or it does not[24].

Green Power Guidelines argues that the portfolio standard is more effective than retail market approaches because it enables "Green Power operators to achieve economies of scale and improve economic efficiency by developing large facilities" and because the

[24] An important point to note here, is that a renewable portfolio standard, or renewable obligation, does not necessarily correspond to current and developing green power labelling and certification standards. That is, a government could conceivably pass legislation specifying its own criteria for qualifying power sources. However, these new criteria then effectively become an eco-labelling standard.

increased costs typically involved with generating green power are then "shared among all consumers". While more communitarian in orientation, the portfolio standard approach is trapped in the conservationist logic of individual and societal responsibility, in which the regulation of a small amount of human action in one area, here in the generation of a small percentage of electricity production, legitimates, offsets, or excuses the majority of human action (i.e. the generation of electricity through environmentally-degrading means). In this way there are very little guarantees offered by an RPS in terms of overall environmental performance. What is assured by an RPS however, are increasing development of renewable technologies and the exploitation of associated renewable resources. What is not ensured for the overall energy system are reductions in: emissions, nuclear or large-scale hydro development, impact in wildlife, watershed or any of the other implicit or explicit goals of green power advocates and practitioners.

To explain this simply and succinctly: electricity generation could double or triple under an RPS (as it could, of course, without an RPS) with the remaining 90% of generation coming from any manner of sources unaffected by the RPS. The RPS would simply ensure that such increases were accompanied by a proportional increase in renewable energy generation. As such, portfolio standards prioritize the widespread development of alternative energy over reductions in demand and consumption, over the "greening" of current sources, and over stringent monitoring of the impacts of green power. In the case of both portfolio standards and retail market strategies, new demand for green power can be, and in some cases must be met by the construction of new "green" power generation facilities, such as wind turbines, without addressing concerns citizens have with existing power generation resources and technologies. This can create demand for new power generation facilities, even where there was previously no demand for more power. Furthermore, such situation of surplus generation potential could serve to encourage increased energy consumption, particularly as surplus energy can serve to lower electricity rates.

Green Power in (and out of) Context

In focussing attention on the resources and technologies of production, while fetishizing each as producing predetermined (prepolitical) outcomes, the alternative energy imperative neglects attention to broader understandings of the ways in which the technologies fit into larger social, ecological and built contexts. As a result, the processes of production come to exist as a political vacuum, limiting the sphere of political contest and critique to a narrow choice among techno-resources with predetermined impacts. The purpose of this section is to begin to reconnect these techno-resources to broader contexts, by briefly exploring just two of the key issues located outside of the focus of techno-fix politics: i. how alternative energy technologies relate to energy transmission systems (through an overview of the concept of distributed generation) and ii. the relationship between energy consumption and generation.

Electricity transmission and distributed generation

The term distributed generation "generally applies to relatively small generating units of 30MW or less sited at or near customer sites" (Chambers, 2001, p. 4). "For many years, conventional wisdom... subscribed to the 'economies of scale' approach for new power plant construction. Bigger power plants meant lower unit costs in dollars per kilowatt hour" (p. 21). Yet "large power generation facilities are capital-intensive undertakings that require an immense transmission and distribution grid to move the power" (p. 4). As the electricity grid across North America shows its age "and with new transmission lines almost non-existent" distributed generation has been receiving increased attention (p. 3). For many energy analysts, increasing attention to distributed generation is as important and 'revolutionary' as developments in alternative energy, though they have the potential to be intimately connected.

In this thesis I use the term distributed generation not only to refer to small-scale generation facilities, but also to the body of arguments that are put forth in favour of the use of distributed generation and in critique of excessive dependence upon large-scale centralized energy systems.

One concern with large, centralized energy facilities is financial. "It can cost $365 to $1,100 per kilowatt hour to run a six-mile power line to a 3 MW customer [whereas] a distributed generation system can potentially satisfy the same load at $400 to $500 per kilowatt hour" (Chambers, 2001, p. 22). Furthermore, a substantial amount of energy can be lost in long-distance transmission. By producing energy near where it is needed distributed generation facilities reduce these losses, meaning less energy that needs to be generated. Energy losses through transmission are a complex and highly contingent subject, yet they are substantial. According to the U.S. Department of Energy (DOE) "among U.S. utilities, energy losses associated with transmission and distribution typically fall in the 5 to 10 percent range, with an average of about 7 percent" (Energy Information Administration (EIA) / DOE, 1997). Chambers estimates that in some parts of the world transmission losses are as high as 30% (p. 22).

Another concern is with the flexibility and responsiveness of energy systems. Smaller, distributed generation facilities can be commissioned in a much shorter time frame than larger, more centralized facilities, creating a more flexible and responsive energy system. From an environmental and social justice perspective, these developments are very significant. Less energy lost in transmission mean less energy that needs to be generated which can potentially translate to a smaller environmental impact. Similarly, a more flexible and adaptable energy system means less chance of overcapacity brought about by trying to prepare for potential electricity demands ten to twenty-five years in the future. Exaggerated estimations of long-term future energy needs have frequently been the basis upon which the construction of large-scale hydro and nuclear facilities has been justified, often with tremendous consequences for affected communities[25].

Distributed generation was important to the early emergence of wind-generated electricity in Canada and the United States. Before the development of large-scale "interconnected networks of electricity transmission and distribution lines" across rural areas "millions of farmers... turned to windmills to power their pumps and lights" (p. 21).

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[25] See for example, histories of Ontario Hydro and Hydro-Quebec such as MacDonald, 1997; McCutcheon, 1991; McKay, 1983; 2002; and Isacsson and Phillips, 1990, or for international examples, McCully, 1996.

Chambers suggests that now wind may be "the most viable as a distributed generation resource" (p. 122). Chambers bases this claim on the notions that "wind energy can be produced anywhere the wind blows," and that it "creates no pollution and has very little impact on the land" (p. 123). Chambers comments speak to a particular potential for wind power: namely that it can be constructed in small, dispersed plants where energy is needed most, without creating additional demand for grid infrastructure. This plays on long-standing ideas about wind and solar resources: namely that they are freely and widely available to all[26]. Many advocates of solar and wind power have long suggested that these characteristics make solar and wind resources and technologies more environmentally and socially just[27], reconnecting energy generation and consumption, whereby consumers are more likely to be aware of where their energy comes from and to be the ones who bare any negative impacts associated with its generation. Further, by building small generation facilities when and where they are needed most, distributed generation is understood to allow for a more flexible and efficient energy system, with higher quality power, smaller losses from transmission, and less likely to result in overproduction and wasted energy.

Unfortunately, this is not the primary way that wind power is currently being developed in Canada. Rather, most of the wind energy produced in Canada to-date follows the large, centralized generation model of traditional power sources. Canada's wind generation capacity of just over 205 MW is overwhelmingly concentrated in a very few aggregated wind farms: on Cowley Ridge, in southern Alberta near the town of Pincher Creek, and on the Gaspé Penninsula in eastern Québec around the towns of Cap-Chat and Matane. 44.7 % of Canada's wind generation capacity is located in the Pincher Creek area, while Hydro-Québec's Le Nordais project on the Gaspé Peninsula accounts for 49.6 %. The location of each of these projects is primarily a result of the ideal wind conditions (as well as the low population-density) found in the two areas. Neither the concentration of

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[26] For a historical perspective, see for example, Righter, 1996, in particular, pp., 10-13; as well as Berman and O'Connor, 1996.

[27] Perhaps the most famous texts promoting the inherent social and ecological benefits of alternative energy are Lovins, 1977; Lovins in Nash (Ed.), 1979; and Hayes, 1977. For a classic (albeit brief) summary and analysis of such positions, see Winner, 1986.

projects around Pincher Creek, nor the 102 MW Le Nordais project can hardly be considered an example of distributed generation.

This situation of wind power development in-line with the traditional model of centralized generation is not unique to Canada. Worldwide the trend in wind power development is toward ever-larger turbines aggregated in locations with the best wind conditions. Perhaps the most significant current trend in wind power development is the construction of ever-larger offshore wind farms, primarily due to higher, more constant wind speeds found offshore.

There are currently ten offshore wind projects in operation in Denmark, Holland, Sweden and the United Kingdom and many more under construction, awaiting approval, or in planning and engineering. Construction was completed on August 31st, 2002 for the world's largest offshore project "Horns Reef Wind Farm", located off the west coast of Denmark. The project consists of 80 wind turbines with a total capacity of 160 MW, however there are several larger offshore wind projects currently in planning or construction phases.

Engineering is currently underway for an offshore wind farm in Ireland approximately 70 km south of Dublin. The project, which will be the world's largest, will comprise 200 turbines with a 520 MW capacity, more than 2.5 times Canada's total current wind generation capacity. The project is expected to supply more than 10% of Ireland's electricity requirements. In Germany, it is expected that by 2030 fifteen percent of electricity production will come from offshore wind farms alone. According to German Environment Minister and Green Party member Jürgen Tritten there could be as many as 4 000 wind turbines in the North Sea by the year 2030 ("Germany Substitutes Wind", 2001). Construction was originally expected to start this past summer on a wind farm in the North Sea, 45 km offshore. The project will be larger (208 turbines producing 4.2 million MW hours of electricity), built in deeper water (30m) and located further offshore than any currently existing offshore wind farm (Malcher, June 17, 2002, p. 94). Yet the

project is currently stalled as a result of opposition to the on-shore transmission lines from the wind farm that will pass through a national park (p. 94).

In addition to numerous offshore projects underway in Northern Europe, several projects are being considered for the east coast of the United States, most notably: a 100-140 MW project being considered by the Long Island Power Authority[28] and a $700 million, 420 MW wind farm to be built 5 miles off the coast of Cape Cod, Massachusetts, in Nantucket Sound. The Nantucket Sound project, which would consist of 170 turbines generating power by 2005 has generated substantial controversy. Located between the south shore of Cape Cod, Martha's Vineyard and Nantucket, the $700 million project is facing strong opposition from some very wealthy and high-profile area residents, who have organized a group calling itself Alliance to Protect Nantucket Sound (see for example Roosevelt, 2002). The group includes Robert Kennedy Jr. and United States Senator Edward Kennedy.

As wind farms have increased in size and number, so too has their opposition. German environmentalists, as well as the general public, are quite divided on the environmental impact of offshore wind farms. The widespread opposition generated by some wind farms in Germany has spawned two popular books that have received wide attention. *Windy Protest: Conflict Surrounding the Future Potential of Wind Power* (Alt et al., 1998), and the controversial *Wind Power: An Alternative That Isn't One* (Wolfrum et al., 2000), now in its third edition[29]. Further, an English-language book focused more broadly on the United States and Europe was published in 2002 examining the visual impacts of wind turbines and how to mitigate them (Pasqualetti et al.).

Thus, location of generation facilities in relation both to local ecosystems and to the locations where the energy produced will be used are important considerations, yet they

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[28] Long Island Power Authority (LIPA) released a request for proposals (RFP) for this project on January 22, 2003 (see www.lipower.org/newscenter/pr/2003/jan22.html) that would see this project completed and operational by the end of 2007. The RFP calls for 25-50 turbines with a total nameplate capacity of 100-140MW located between 2.5 and 6 nautical miles from shore, near Jones Beach, Long Island (ibid).

[29] My translation of the titles.

are considerations infrequently addressed in much green power advocacy and policy. The result is that arguments for greater use of distributed generation—that were once some of the strongest arguments for the development of wind and solar power—can be seen as an important critique of these developments. As a result, we see the ways in which wind power development is following the large-centralized power plant model of nuclear and large-hydro power development: a form of development so often critiqued by earlier alternative energy advocates. Moreover, by moving offshore, wind energy development is facilitating the extension of the frontiers of large-scale energy exploitation and generation to coastal waters.

However, the project of reconnecting energy generation facilities to broader social-material and ecological contexts demands an even broader analysis than the focus on production and transmission contributed by a distributed generation critique. Rather, I argue that we must also consider energy demand and consumption in relation to production and transmission.

Reconnecting consumption: Green paper without green electricity

As addressed above, Luukkanen asks why wood is the only production factor considered in determining what constitutes 'green' paper and he suggests that since electricity is a major component of the papermaking process, green electricity should be a requirement for green paper (2000). In asking us to consider the links between the impacts of various resources that go into making a product like paper, Luukkanen's argument implores us to recognize the complexity and multifaceted nature of eco-social issues and impacts.

But can we also turn Luukkanen's argument back on itself and ask whether electricity should be able to be considered green if it enables an environmentally undesirable process? In other words, if green electricity is used for an environmentally destructive end, such as non-green papermaking, or aluminum smelting, should it still be considered green energy? Or are the technologies and resources used to make electricity the only factors that need to be considered in order that we consider a given supply of energy to be green? But we can also ask: Why is it only the life-cycle of an energy technology that is

considered in an LCA or LCVA? And why not consider the life-cycle of the electricity before determining if that electricity is green?

Chapter V. Conclusion

In closing, I want to begin to explore some of the broader questions related to environment and energy that have concerned me in researching and writing this thesis. These include: How do we concern ourselves with energy and the environment without recourse to any objective or deterministic sense of green-ness? Are green-ness and environmentalism useful or relevant concepts? What would an anti-essentialist, anti-colonialist and democratizing approach to environment and energy look like?

In the following section I focus on the question of green-ness as a first step toward addressing the final two questions of how to construct a post-crisis, anti-essentialist and democratizing environmental politic.

On the (Im)Possibility of Green-ness: Is 'Green' a Useful Concept?

In many ways green-ness and environmentalism are concepts much like democracy, feminism and social justice: they are contingent and subjective constructs and not states of being. In my opinion, they are therefore not useful as objective descriptors. I bristle at the suggestion that a technology can *be* green or environmentally-friendly, as I do at the suggestion that a technology can *be* feminist or democratic. To say that something *is* democratic, feminist, or just without acknowledging the contextuality or contingency of the specific circumstance—not to mention the contestability of how one defines democracy or feminism—is a bold political statement, involving some degree of arrogance. These terms depend upon social relations that extend beyond the thing (or person/s) in question and therefore involve an essentializing judgment *for* or *about others*. To describe a person, process or thing as feminist, for example, not only involves an assumption as to an agreed upon definition, but it also involves some form of essentialization of the identity category of woman and of the political aspirations of those subscribing and subscribed to that category. And yet I have even more trepidation for the concept of green-ness.

There is an added dimension to green-ness and environmentalism that makes them more dangerous: namely, that they imply the ability to speak for some notion of non-human

nature. The author who refers to a wind turbine as environmentally-friendly or environmentally-benign is making a judgment (whether they recognize it as such or not) as to what is good for some essentialized concept of environment and nature. So too is the person who calls themselves an environmentalist.

I could say that green-ness, like environmentalism, is anthropocentric, but that would not be particularly helpful. That green-ness is anthropocentric is a truism: like democracy or feminism, it cannot be otherwise. We are humans and as such, we have no choice in the matter[30]. Anthropocentrism is something that we are taught is dangerous, and it is. Yet to claim that a version of green-ness or environmentalism is not anthropocentric (as a deep-ecologist might) is perhaps even more dangerous. What makes the notion of green-ness more problematic than democracy or feminism with regard to being anthropocentric is that green-ness pretends to be otherwise.

So what do we do with these terms: Is 'green' worth using, or rescuing? The immediate answer is that, yes, green is a term we need to continue to use, but under what conditions? Like democracy and feminism, green and environmentalism represent identity categories, political beliefs, ethics and personal experiences. Clearly they hold a wide-variety of meaning that must be appreciated and could not easily be discarded or forgotten. But I argue that we do need to seriously reevaluate our use of the terms.

For how to deal with these terms we can take guidance from contemporary critical theory on how to deal with the term "race". "Race" represents a unique and horrifying past and present (and undoubtedly a future) that cannot be ignored or forgotten. To discard it would be to obscure the continued social and material relations and profound effects that the term represents. So often it is a term that is bracketed: used with an acknowledgement of the difficulties its use presents. As with "race", we cannot simply discard terms like "green" and "environmentalist", our society is far too invested in them.

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[30] Whether we can commune or communicate with the other entities with which we share the planet is irrelevant—we are still communicating, understanding and interpreting through our position as humans.

Rather, we need to take great care in remembering the histories, contexts, and risks involved in their use, without falling back into fixed categories.

In many ways, I suggest that how we deal with terms like 'green' and 'environmentalist' should parallel (and to an extent precede) the ways in which I earlier suggested we approach energy systems and techno-sources more generally. We need to critically interrogate both our energy systems and the discourses that surround them. We need to ask why we use terms like 'green' and 'environmental' and what we intend to get out of them, just as we need to ask what we want from our energy systems and why we use energy as we do.

Green-ness, like uranium, is dangerous. When it comes to the question of what to do with uranium, my answer is as follows: for uranium that is still underground, my answer is simple: leave it alone and try to stay away from it. For uranium that has already been mined, processed and is either ready to be used as fuel or already spent the answer is more complex: we cannot simply forget about it or ignore it, and discarding it is not a simple or short-term process—it requires great care no matter how we choose to deal with it. So too should our use of terms like green and environmentalist.

Just as our energy systems need to reflect a more creative, radical and plural democratic energy politics, so too must our discursive constructions of green and environmentalist recognize the contingency and subjectivity involved in such valuations. This is one of the first steps in imagining and creating the conditions of possibility for an anti-essentialist, anti-colonialist and democratizing approach to (alternative) energy and environmental politics.

Toward Anti-Essentialist Energy Policy

As I have begun to demonstrate in this thesis, the green power project constructs a narrative whereby changing the resources and technologies used to produce energy, and electricity in particular, will result in a (partial or total) solution to a host of environmental, social and health-related concerns (greenhouse gases and global warming,

smog and lung diseases, oil dependence and international security, dwindling fossil fuel reserves, etc.). More specifically, the narrative contends that the construction of new green power facilities to generate electricity is key to solving these problems.

Typically, the green power narrative does not speak explicitly to the fate of currently existing non-green power plants nor to the communities in which they exist. Nor does it frequently address energy consumption, the transmission of electricity, or the communities in which these new power plants will be built. In short, the green power narrative is focused specifically on new construction of power plants using a specific set of technologies and resources and it is a narrative that does not take a wider examination of the larger energy systems in which these power plants do, and increasingly will exist.

By focusing our attention on the resources and technologies of electricity production, the green power narrative obscures broader analyses and critiques of energy systems, as well as of the place of these resources and technologies within energy systems and broader societal contexts. Not only does this serve to shift energy discourses toward questions of technologies and resources, but it also skews political discourses of energy, society and environment by affecting a reframing of eco-social energy concerns, creating a technological and resource imperative: the alternative energy imperative.

The point to be made here is that current green power programs certify electricity as green on the basis of an evaluation of the power plant used to produce it (including the primary resource used in this process, e.g. wind, coal, natural gas, etc.). In many ways this is an arbitrary selection of focus for the impact assessment: the transmission lines, the means and purpose in which the electricity is consumed, as well as a number of broader social and ecological contexts could all be factors considered in the evaluation of the environmental performance of electricity.

If we look at what aspects of electricity systems (and energy systems more generally) are assessed: how and when they are evaluated (methodologically) and how those assessments are then interpreted, we see a very narrow and consistent pattern.

Assessments are centred around individual generating facilities, and in particular their technologies and resources. Assessments are conducted by scientific experts prior to or during construction (and occasionally during expansion) of facilities and generally centre around achieving a judgement of approval[31]. If communities are consulted in the process of impact assessment the terms of their involvement are invariably determined by the experts, with little or no opportunity for the community to determine for itself how impacts should be assessed. For the most part the results of such assessments are not widely accessible to the public[32].

I argue here that the project of green power does not seek to broaden this scope of assessment by any means, but rather further entrenches the compartmentalization of energy systems and impact assessments by reducing assessment to a dichotomy of greenness based solely on a narrow, one-time, primarily biophysical evaluation of technosources based primarily on those factors most easily predictable and quantifiable across all cases. This strategy only offers a response to those concerns that derive from the specific nature of the technologies and resources currently in use, and only to the extent that these technologies serve to replace and not augment the use of current energy technologies.

The costs of this strategy are three-fold: 1) It serves to increase the focus upon generation facilities and to obscure any concerns with other aspects of energy generation. That is to say that it increases the taken-for-grantedness of other aspects of energy generation. In green power labelling the greenness of the generating facility becomes totalizing; electricity generated from certified generating facilities becomes green electricity, and the

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[31] Admittedly, assessments can and frequently are more complex than this brief summary accounts for, in the sense that approval processes can require project alterations or concessions, and public participation is occasionally included in assessment processes. However, I would argue that in such cases, the general pattern I have outlined above still holds.

[32] While in many cases the public may have the legal right to access some or part of the details of the assessment, or they may be available beyond legal rights, they are nevertheless not easily available to most citizens in the sense that they would require significant effort on the part of communities or individual citizens to access, or that it is not widely known that the documents exist or are accessible, or how to access them.

environmental impacts of any other aspect of the energy system that results in the consumption of the electricity is negated. Certifying power as green sends a message to consumers of green power that they need not worry about the environmental impact of the energy they are consuming, that it is not only low-impact but environmentally-friendly, so why should they examine it more closely?

2) By placing concerns solely around techno-sources the green power strategy negates any responsibility held by those who have directed and/or profited from the same energy systems that have led to ecological and social concerns over energy. If the concerns are seen as inherent to technologies and resources then those who have made and profited from decisions as to how to organize and apply energy systems presently and in the past are not to blame and are free to continue to direct and profit from energy systems as they have previously through simply substituting different technologies and resources.

3) An additional concern is that the Green Power approach to impact assessment—like the dominant approach to energy impact assessment—not only focuses on technologies deterministically (i.e. generalizing impacts from one or few cases to the technology as a whole) but also as individual cases as though they existed in a vacuum. That is to say, we have information about what the impacts of particular individual wind farms and of hypothetical (proposed) wind farms, but little or no information or even speculation about what the impacts of having fifty or one hundred wind farms in a given region would be. Consider for example, the case of small, run-of-the-river hydro-electric facilities. Such facilities qualify under most, if not all green power certification programs. But while the impact of one such facility on a given river may be small there are certainly limits to how many such facilities can be installed on a given river before there is a very substantial impact upon the local ecosystem. This is perhaps another area from which we can take lessons from European green power experiences, but we could also learn a great deal from historical examples and the effects of numerous watermills on local ecosystems. In summary, there seems to be little attention to what the impacts of an energy system dominated by green power (a post-fossil fuel energy system) would be, particularly at current or future levels of energy consumption.

Given these costs, my challenge to green power advocates and policy-makers (and to energy analysts and policy-makers more generally) is three-fold: to take broader, more creative and more plurally democratic approaches to energy analysis, advocacy and policy.

Broad in the sense of taking wider and more complex views in attempting to understand and affect social and ecological relationships to energy.

Creative in terms of how we conceive of the socio-political and material infrastructures of energy systems and in terms of how and what we analyze and assess in studying, evaluating and policing energy.

And *plurally democratic* in that we need alternatives to the narrow, centralized authoritarian and expertocratic models of energy policy, production, generation, transmission and consumption that dominate the social and material landscapes of Canada, as elsewhere.

Materially, historically, socially, politically, and ecologically: our approaches must be broader and more creative. This means reconsidering the reductionist and compartmentalizing strategies of energy analysis and policing, while also reconsidering how to conceptualize the relationships between society (humans and the built environment), ecology and energy. I am intentionally using the word relationships here instead of impacts, as one example of how to broaden the scope of energy analysis by going beyond conceiving of humans and ecology as the subject to energy facilities. How do we do this, and what would it look like? This is what will require creativity.

In many ways the tools to begin are already easily available to us. But let me first say that my intention is not to outline what a broader, more creative and more plurally democratic approach to energy should or would look like. That would be to continue to cast an expert dominated approach, and we need more and more diverse, not fewer

participants in energy debates. What we do not need is simply a new authoritarian model. As such, what I want to offer here are some initial suggestions and possibilities in order to further articulate both my challenge to energy and environmental analysts, and my concerns with contemporary energy systems and the green power project.

Impact assessment

The Pembina Institute's Life-Cycle Value Assessment criteria, as stated in *Green Power Guidelines* do provide an excellent starting point in the assessment of individual generating facilities. They propose that we need to develop a high standard against which to compare energy facilities on a variety of quantitative and qualitative criteria (outlined above). My primary critique of the Pembina Institute's LCVA is that in the case of their assessment of a wind turbine, they neglect to assess the turbine on the qualitative criteria and that they compare the wind turbine, not to a "gold standard", but to the status quo of coal and natural gas plants. Furthermore, the Pembina Institute seeks to generalize from this one (incomplete) LCVA to most or all wind turbines, while at the same time failing to assess whether or not there may be cumulative impacts to the rapid development of wind energy (i.e., one turbine in southern Alberta doesn't have much impact, but would thousands?). So my first recommendation is that we demand *vigilance* in the assessment of energy developments and technologies and once more, *vigilance* against deterministic understandings of energy technologies: no technology can be beyond reproach.

Further, we must also move beyond a power plant-centred focus in evaluating energy relationships, and this requires broader, more creative approaches to understanding energy relationships (including impacts). Impact assessment needs to be about relationships between energy, environment and community. Not only do energy facilities impact upon communities, but communities impact upon energy facilities, and each community and environment will have a different relationship to a given energy facility. As such, meaningful impact assessment requires wider participation that extends well beyond consultation. Communities need to have the opportunity and the resources to take lead roles in all stages of impact assessment. This calls for us to re-think the role of

the expert in energy decision-making: communities may often require experts in capacity-building, ecological science and in legal and political processes; they do not need experts in decision-making. The role of the expert must be explicitly in the service of the community.

Another particular need is for broader historical analyses of contemporary Canadian and American energy systems. We need to remember the historical events and ideologies that affected the ways in which early North American energy systems were conceived, especially given the roles that colonialist ideologies played in industrial development in Canada and the United States. By remembering and analyzing this history, we will be better able to understand the ways in which these ideologies are reflected in our contemporary energy systems[33].

Access to information: Electricity labelling and a national registry

One key place to start is with the availability of information to consumers. The project of eco-labelling should be about substantially increasing the amount of information available to consumers and increasing consumer awareness of energy processes and products. Informing consumers that some energy is green and that some is not does not satisfy this demand. Using Type III (also known as scorecard or report card labelling) instead of Type I (stamp of approval) labels would be an excellent step in this direction. There are, of course, still issues of power, reductionism and authority with Type III labels. We must still consider questions such as: Who decides what information will be included? And how is the information represented? But when Type III labelling is structured somewhat like food labels (listing ingredients and nutritional values)—as opposed to a graded report card—it offers the potential to empower consumers by allowing them to decide what constitutes green-ness or desirability from the information provided on the label. So for example, the label could indicate the type of resources used to produce the electricity as well as the region that the electricity comes from. Given the

[33] Several historians have done important work documenting the history of energy in America, but unfortunately such work has yet to have substantial influence on contemporary energy debates. The most notable body of work is that of historian David E. Nye, Professor of American Studies at Odense University, Denmark. In particular, see 1998; 1997; 1990.

intricacies of regional power pools there is really no way of knowing where a given consumer's electricity comes from. However, we can calculate where the total electricity in a given power pool comes from and where the electricity in a given utility company's portfolio comes from. That information could be included on a label to provide consumers with more information about where their electricity comes from.

Such a labelling system must also be supported by a national electricity registry that would give consumers the opportunity to access additional information on energy systems (including, but not limited to generation facilities). Available information could include impact assessments and other types of studies and analyses including detailed information about generation and transmission facilities, and energy regulations and policies. As important as such information is, it is equally essential that such information is easily accessible to consumers in a manner that takes much of the responsibility off of the consumer to locate and obtain information. In other words, much of the information I am calling for here may be currently available, but do I, or you the reader, currently know what information exists, how much of it I have a right to and where I can find it? These questions need to be easier for the general public to answer. Much of this information is available, what is needed is a coordinating effort to collect and organize such information and make sure that citizens know about it and how to access it. The accessibility of information—not simply the *right to know*—must be a cornerstone of a plurally democratic energy politic.

The green power project has succeeded at directing important attention to the environmental impacts of conventional (or non-green) electricity generating facilities. However, the challenge to green power advocates, practitioners and policy-makers must be to ensure that this focus of attention on conventional power technologies and resources does not come at the expense of wider, more complex analyses of energy systems. Further, we must be vigilant to ensure that green power facilities set, and are held to, higher standards in terms of environmental and social relationships. In the words of Schnaiberg and Gould (1994), "every previous source of energy, at one point in its history, made a similar promise of a free lunch and each fell far short of fulfilling such a

promise" (p. 15), and unless we reconfigure our way of thinking about green power technologies and their place within energy systems, the project of green power risks a similar fate.

BIBLIOGRAPHY

Addison, Herbert. (1959). *Sun and shadow at Aswan: A commentary on dams and reservoirs on the Nile at Aswan, yesterday, today, and perhaps tomorrow.* London: Chapman & Hill.

Alt, Franz; Claus, Jurgen; and Scheer, Herman (Eds.). (1998). *Windiger Protest: Konflikte um das Zukunftspotential der Windkraft* [Windy protest: Conflict surrounding the future potential of wind power]. Bochum, Germany: Ponte Press.

Barnett, Jon. (2001). *The meaning of environmental security: Ecological politics and policy in the new security era.* New York: Zed Books.

Berland, Jody. (1996). "Mapping space: Imaging technologies and the planetary body." In S. Aronowitz, B. Martinsons, and M. Menser (Eds.). *Technoscience and cyberculture.* (pp. 123-138). New York: Routledge.

Berlant, Lauren Gail. (1997). *The queen of America goes to Washington city: Essays on sex and citizenship.* Durham, NC: Duke University Press.

Berman, Daniel M. and O'Connor, John T. (1996). *Who owns the sun?: People, politics, and the struggle for a solar economy.* White River Junction, VT: Chelsea Green Publishing.

Bourassa, Robert. (1985). *Power from the north.* Scarborough, ON: Prentice-Hall Canada.

Chambers, Ann. (2001). *Distributed generation: A nontechnical guide.* Tulsa, OK: PennWell.

Coon, David. (1998, August). "Global warming: 10 years of inaction." *Revue écologique en direct éléments Online Environmental Magazine.* Retrieved from http://www.elements.nb.ca/theme/climate/coon/coon.htm

D'Agnese, Joseph (2001, January) "The year in science." *Discover, 22*(1). Retrieved from http://www.discover.com/jan_01/featyearin.html

Davis, Mike. (1999). *Ecology of fear: Los Angeles and the imagination of disaster* (1st Vintage Books ed.). New York: Vintage Books.

Derrida, Jacques. (1976). *Of grammatology* (G. C. Spivak, Trans) (1st American edition). Baltimore: Johns Hopkins University Press.

Derrida, Jacques. (1988). "Letter to a Japanese friend." In D. Wood and R. Bernasconi (Eds.) (D. Wood and A. Benjamin, Trans.), *Derrida and Difference* (pp. 1-6). Evanston: Northwestern University Press.

Desbiens, Caroline. (2000, August). "Pioneers, labourers, water builders... A geography of 'the people' in James Bay." Paper presented at *For Alternative 21st Century Geographies: 2nd International Critical Geography Conference*. Taegu University, Taegu, Korea. Retrieved from http://econgeog.misc.hit-u.ac.jp/icgg/intl_mtgs/CDesbiens.pdf

Desbiens, Caroline. (2001). "Power from the north: The poetics and politics of energy in Québec" [Dissertation abstract]. Retrieved from http://www.ggy.uga.edu/people/faculty/desbiens/thesis_en.html

Dogterom, Jonathan J.; McCulloch, Matthew; and Pape-Salmon, Andrew. (2002, December). *Green power marketing in Canada: The state of the industry*. Drayton Valley, AB: Pembina Institute for Appropriate Development.

Dwivedi, O.P.; Kyba, Patrick; Stoett, Peter and Tiessen, Rebecca. (2001). *Sustainable development and Canada: National and international perspectives*. Peterborough, Ontario: Broadview Press.

Educational Foundation for Nuclear Science. (2003). "Overview." *Bulletin of the Atomic Scientists*. Retrieved from http://www.thebulletin.org/clock.html

Energy Information Administration (EIA) / U.S. Department of Energy (DOE). (1997, October). "2. Reducing emissions from electricity supply." In *Mitigating Greenhouse Gas Emissions: Voluntary Reporting* (chap. 2). Retrieved from http://www.eia.doe.gov/oiaf/1605/vr96rpt/chap2.html

Espace Eolien Développement (EED). (1997-2002). "Petit glossaire franco-anglais de l'éolien". Retrieved from http://www.espace-eolien.fr/Eolien/Glossaire.HTM

Foucault, Michel. (1980). *Power/knowledge : selected interviews and other writings, 1972-1977* (C. Gordon, Ed; C. Gordon et al., Trans) (1st American ed). New York: Pantheon Books.

"Germany substitutes wind for nuclear power." (2001, June 11). *Environment News Service (ENS)*.

Gordon, Anita and Suzuki, David. (1990). *It's a matter of survival*. Toronto: Stoddart Publishing.

Green-E. (2001, March 22). "Frequently asked questions: Green-e renewable electricity certification". Retrieved from http://www.green-e.org/pdf/faq.pdf

Greenpeace. (1997, December 8). "The Vice President of the US comes to visit at the climate summit." Retrieved from http://archive.greenpeace.org/pressreleases/climate/1997dec82.html

Hayes, Denis. (1977). *Rays of hope: The transition to a post-petroleum world* (1st ed.). New York: Norton.

Hes, Dominique. (2000). "Introduction to ecolabelling standards, issues, experiences and the use of LCA." Paper presented at *Pathways to Eco Efficiency: Second National Conference on Life Cycle Assessment*, Melbourne, Australia. Retrieved from http://lca-conf.rmit.edu.au/Papers/ecolabel.doc

Horkheimer, Max and Adorno, Theodor W. (1947/1969). *Dialektik der Aufklärung* [Dialectic of enlightenment]. Frankfurt am Main: Fischer.

Hornung, Robert. (1998a). *Canadian solutions: Practical and affordable steps to fight climate change*. Vancouver: David Suzuki Foundation ; Drayton Valley, Alta. : Pembina Institute for Appropriate Development.

Hornung, Robert. (1998b, October). *Canadian solutions: Practical and affordable steps to fight climate change* (Executive Summary). Vancouver: David Suzuki Foundation ; Drayton Valley, Alta. : Pembina Institute for Appropriate Development.

Hughes, J. Donald. (2000, December). "Ripples in Clio's pond: The dams at Aswan: Does environmental history inform decisions?" *Capitalism, Nature, Socialism. 11*: 73–81.

Hunter, Justine. (1997, April 22). "Forest protests promised: Premier Glen Clark says Greenpeace campaigners are enemies of B.C." [FINAL ed.]. *The Vancouver Sun*, p. B6.

Hyvärinen, Antero. (1999). "Eco-labelling and environmentally friendly products and production methods affecting the international trade in textiles and clothing." *Introduction of the Agreement on Textiles and Clothing (ATC) and Its Implications on Developing Country Producers/Exporters*. International Trade Centre. Retrieved from http://www.intracen.org/mds/sectors/textiles/ecour99.htm

Isacsson, Magnus (Director), and Phillips, Dale (Producer). (1990). *Uranium: ... a thought provoking look at Canada's uranium industry* [Videotape]. Montréal: National Film Board of Canada.

Isacsson, Magnus (Director), and Salzman, Glen (Producer). (1996). *Power: One river, two nations* [Videotape]. Québec: National Film Board of Canada.

Jaimet, Kate. (2002, December 24). "Ontario eyes Manitoba's 'clean' hydro." *The Ottawa Citizen* [Final ed.], p. A6.

Kessler, Mark. (1993). "Legal discourse and political intolerance: The ideology of clear and present danger." *Law & Society Review. 27*: 559-597.

Laird, Gordon. (2002). *Power: Journeys across an energy nation*. Toronto: Penguin Books of Canada.

Leggett, Jeremy. (n.d.) "An environmentalist's perspective on the current state of the climate debate." Retrieved from http://www.gcrio.org/USGCRP/sustain/leggett.html

Long Island Power Authority (LIPA). (2003, January 22). "LIPA issues RFP for offshore wind generation project: Phase II site study shows south shore area near Jones Beach as optimal location for island's first wind turbines." Retrieved on March 2, 2003 from http://www.lipower.org/newscenter/pr/2003/jan22.html.

Lovins, Amory B. (1977). *Soft energy paths: Toward a durable peace*. New York: Penguin.

Lundy, Andrew. (1998, August 5). "Wind power project gets financing: Le Nordais project." *Financial Post Daily*, p. 4.

Luukkanen, Jyrki. (2000, November). "Green paper with green electricity: Paper industry constructing the narratives of threats and opportunities." Paper presented November 20, 2000 at: *Energy Markets in the Making: Strategies for the New Millennium*, Salzburg, Austria.

MacDonald, Donald C. (1997 August 27). "Hydro under influence of a nuclear cult." *The Toronto Star*, p. A25.

Malcher, Ingo. (2002, June 17). "Gegenwind für Offshore: Ab 2030 sollen 15 Prozent des deutschen Strombedarfs von Windkraftwerken vor der Küste kommen. Doch Behörden vor Ort gefährden das ehrgeizige Ziel" [Against the wind for offshore: By 2030, 15% of German electricity current supply from wind power will come from the coast. But officials there are endangering the ambitious goal]. *Der Spiegel*, p. 94.

McCulloch, Matthew; Raynolds, Marlo; and Laurie, Michelle. (2000, February). *Life-cycle value assessment of a wind turbine: Alberta, Canada*. Drayton Valley, AB: Pembina Institute for Appropriate Development.

McCully, Patrick. (1996). *Silenced rivers: The ecology and politics of large dams*. London: Zed Books.

McCutcheon, Sean. (1991). *Electric rivers: The story of the James Bay project*. Montréal: Black Rose Books.

McKay, Paul. (1983). *Electric empire: The inside story of Ontario Hydro*. Toronto: Between the Lines.

McKay, Paul. (2002, November 12). "Ontario Hydro's fiscal meltdown: Bills are up, many plants are down – and dirty: Paul McKay explains how it got broke, and how to fix it." *The Ottawa Citizen*, p. A17.

Miller, Clark and Edwards, Paul N. (2001). *Changing the atmosphere: Expert knowledge and environmental governance*. Cambridge, MA: MIT Press.

Mittelstaedt, Martin. (2003, January 4). "Who has seen the wind power? In the post-Kyoto age, the Canadian energy industry is gearing up to reap the benefits of airborne kilowatts." *Globe & Mail*.

Nader, Ralph. (2000, October 20). "Statement on global warming." Retrieved from http://www.votenader.com/issues/enviro_globalwarming.html

Nash, Hugh (Ed.). (1979). *The Energy controversy: Soft path questions & answers / by Amory Lovins and his critics*. San Francisco: Friends of the Earth.

"Not sinking but drowning." (2000, May 13). *The Economist, 355*(8170), 87.

Nye, David E. (1990). *Electrifying America: Social meanings of a new technology, 1880-1940*. Cambridge, MA: MIT Press.

Nye, David E. (1997). *Narratives and spaces: Technology and the construction of American culture*. New York: Columbia University Press.

Nye, David E. (1998). *Consuming power: A social history of American energies*. Cambridge, MA: MIT Press.

Pacific Institute for the Mathematical Sciences. (2003, March). "Math jokes." *π in the Sky*. p. 25.

Pape-Salmon, Andrew; Dogterom, Jonathan; Wieler, Carissa; and Anielski, Mark. (2003, February). *Low-impact renewable energy policy in Canada: Strengths, gaps and a path forward*. Drayton Valley, AB: Pembina Institute for Appropriate Development.

Pasqualetti, Martin J.; Gipe, Paul; and Righter, Robert W. (Eds.). (2002). *Wind power in view: Energy landscapes in a crowded world*. San Diego, CA: Academic Press.

Pembina Institute for Appropriate Development. (2002). "About Pembina." Retrieved on Sept. 15, 2002 from http://www.pembina.org/about.asp

Pembina Institute for Appropriate Development (PIAD). (1998-2002). "LCVA - an analysis tool for integrating triple-bottom-line considerations" [Home page]. Retrieved from http://www.lcva.ca/index2.htm?LCVA_token=3LG03

Phillips, Sue and Edwards, Richard. (2000). "Development, impact assessment and the praise culture." *Critique of Anthropology. 20*(1), 47-66.

Pratt, Larry and Urquhart, Ian. (1994). *The last great forest: Japanese multinationals and Alberta's northern forests*. Edmonton, AB: NeWest Publishers Limited.

Question period [Television broadcast]. (2002, October 27). CTV.

Raynolds, Marlo and Pape, Andrew. (2000, July). *The Pembina Institute green power guidelines for Canada*. Drayton Valley, AB: Pembina Institute for Appropriate Development.

Rifkin, Jeremy (with Howard, Ted). (1989). *Entropy: Into the greenhouse world*. New York: Bantam Books.

Righter, Robert W. (1996). *Wind energy in America: A history*. Norman, OK: University of Oklahoma Press.

Roosevelt, Margot. (2002, September 30). "Not in my back bay: Everybody likes the idea of windmills, but nobody wants to live near them—not even in Massachusetts." *Time Magazine* [Canadian ed.]. pp. 38-39.

Sachs, Wolfgang. (1999). *Planetary dialectics: Explorations in environment and development*. Halifax, N.S.: Fernwood.

Said, Edward W. (1978). *Orientalism*. New York: Vintage Books.

Schnaiberg, Allan and Gould, Kenneth Alan. (1994). *Environment and society: The enduring conflict*. New York: St. Martin's Press.

Sclove, Richard. (1995). *Democracy and technology*. New York: Guilford Press.

Seager, Joni. (1993). *Earth follies: Coming to feminist terms with the global environmental crisis*. New York: Routledge.

Shiva, Vandana. (1989). *Staying alive: Women, ecology, and development*. London: Zed Books.

Shiva, Vandana. (1997). *Biopiracy: The plunder of nature and knowledge*. Boston, MA: South End Press.

Sierra Club of/du Canada. (2002, February 14). "Valentine for big oil and coal: Accounting tricks to claim reductions when the real books show increases!" Retrieved from http://www.sierraclub.ca/national/media/big-oil-coal-02-02-14.html

Smits, Martijntje. (2001). "Langdon Winner: Technology as a shadow constitution." In H. Achterhuis (Ed.) (R. P. Crease, Trans.), *American philosophy of technology: The empirical turn* (pp. 147-169). Bloomington, IN: Indiana University Press.

Swift, Allan. (1998, September 20). "First windmills go into production: Nordais wind farm in Gaspé." *Canadian Press Newswire.*

Teich, Albert H. (Ed.). (1997). *Technology and the future* (7th ed.). New York: St. Martin's Press.

Thompson, Peter. (1997). "New age mysticism, postmodernism and human liberation." In C. Riordan (Ed.), *Green thought in German culture: historical and contemporary perspectives* (pp. 107-124). Cardiff: University of Wales Press.

Toronto Renewable Energy Co-op (TREC). (2003, February). Available from "FAQ" [link in menu], www.windshare.ca

Torrie, Ralph. (2000, May 19). "A clear and present danger: We can cut greenhouse gases by half and it won't hurt a bit." *Globe & Mail.*

Turner, Chris. (2002, November 18). "How's the weather?" *Time* [Canadian ed.]. *160*(21), 78.

United Nations Environment Programme: Division of Technology, Industry and Economics. (2000). *Natural selection: Evolving choices for renewable energy technology and policy.* Paris: UNEP.

Vierhaus, Rudolph. (1996). "Progress: Ideas, skepticism, and critique—the heritage of the enlightenment" (J. B. Knudsen, Trans.). In J. Schmidt (Ed.), *What is enlightenment: Eighteenth-century answers and twentieth-century questions* (pp. 340-341). Berkeley and Los Angeles, CA: University of California Press.

Weiland, Christoph Martin. (1789/1996). "A couple of gold nuggets, from the... wastepaper, or six answers to six questions" (K. P. Geiman and J. Schmidt, Trans.). In J. Schmidt (Ed.), *What is enlightenment: Eighteenth-century answers and twentieth-century questions* (pp. 78-83). Berkeley and Los Angeles, CA: University of California Press.

Weinberg, Alvin M. (1966, December). "Can technology replace social engineering?" *Bulletin of the Atomic Scientists. 22*(12), 4-8.

Winner, Langdon. (1980). "The whale and the reactor: A personal memoir." *The Journal of American Culture*. Summer.

Winner, Langdon. (1986). *The Whale and the reactor: A search for limits in an age of high technology*. Chicago: University of Chicago Press.

Wolfrum, Otfried; Ernst, Hans; Filbrandt, Ulrich; Moch, Thomas; and Niemand, Walter. (2000). *Windkraft: Eine Alternative, die keine ist* [Wind power: An alternative that isn't one] (3rd ed.). Frankfurt am Main, Germany: Zweitausendeins.

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